

DECISION- MAKING & SURGERY

Recommendations

The decision to operate in complex cases can benefit from the formal involvement of others apart from the surgeon. Critical care specialists should be more directly involved.

Failure to diagnose acute appendicitis can still cause death in fit young adults. It is essential that experienced clinicians are available to ensure that cases are not missed.

Non-availability of a patient's previous notes at the time of an acute admission is a major administrative failure and should be exposed as such.

INTRODUCTION

This section focuses on the decision-making concerning the need for surgery and the timing of the operation. Clinical practice can vary considerably between individual anaesthetists and surgeons and many decisions about disease management cannot be made with mathematical precision. There are many factors that influence a clinician's judgement including knowledge, advice and support from colleagues and previous experience. The challenge of older, sicker patients undergoing increasingly complex surgery requires continuous review of routine practice in anaesthesia and surgery. Examining the management of cases such as those described here helps to identify where there is potential for improving current practice.

INVOLVEMENT OF THE CONSULTANT SURGEON

When deaths within the first three days of a surgical operation were last examined by NCEPOD in 1994/95 [3] it was reported that the consultant surgeon was involved in the decision-making prior to surgery in 88% (1201/1366) of cases. In this report, the figure has increased to 93% (1958 of the total operations of 2114). The working diagnosis was made by the consultant surgeon in 85% (1805/2114) of patients.

The number of cases in which the consultant surgeon is involved in the decision-making continues to increase and this involvement is now very high.

For three out of four patients, their operation was either urgent or an emergency (1582/2114). This is a reflection of the fact that deaths within the first three days of their operation will be more frequent in patients admitted in these categories. Clearly, it is essential that consultants are involved in decision-making in these patients. It is therefore reassuring that, over the years, successive NCEPOD reports have shown a steady increase in consultant involvement in decision-making.

INVOLVEMENT OF OTHERS INCLUDING CRITICAL CARE PHYSICIANS IN THE DECISION TO OPERATE

Traditionally, the consultant surgeon has been solely responsible for taking decisions concerning the management of their patients. Whilst discussion may take place with the anaesthetist, whose views can influence the course of action, ultimately the surgeon decides, obtains the patient's consent and then the operation takes place. When, in the past, a successful outcome was primarily dependent on the quality of the surgery, the dedication of the nursing staff and the patient's own willpower, this approach was not questioned. However, as surgery has become more complex and the patients accepted for surgery are increasingly less fit, it is evident that the surgeon alone does not always have the ability to weigh up all the risks and benefits in the decision to operate. Critical care has become an essential adjunct to major surgery, both in the preparation of the patient and the immediate postoperative care. In many cases, it is now the quality of the critical care that determines the surgical outcome.

Modern critical care is highly interventional and is very often stressful for the patient. Decisions as to the appropriateness of its use for any individual require a high level of judgement. The required resource, ethical and other aspects of its use, place the clinician concerned in a vulnerable position. In many ways, it is easier for the surgeon to ignore these difficulties and to go ahead and operate, sending the patient to the intensive care unit after the operation and leaving the intensive care team to continue the management. If the consequence is a series of patients with a hopeless prognosis receiving major surgery with no prospect of a successful outcome, then it is clear that, as NCEPOD has recommended in the past, surgery is inappropriate. Optimism cannot be a substitute for realism.

Because NCEPOD only examines cases where the patient has died following surgery, it is not possible to cite examples of successful outcomes which were primarily the result of excellent critical care. However, within the cases examined there are examples where a more inclusive approach to decision-making would have been of value.

Case Study 20

An 80-year-old female was admitted directly from the surgical outpatients' clinic with a history of chronic constipation and lower abdominal pain. She was recorded as being extremely thin (38 kg) and cachectic in appearance; she was also anaemic (Hb 8.7 gm/dl). In the past, she had had two myocardial infarcts and continued to have unstable angina. A CT scan soon after admission showed features of extensive intra-peritoneal malignancy and dilated large bowel. After just over three weeks in hospital a decision was made to operate. The surgeon states that "although she was frail, she was otherwise reasonably well". Despite the apparent risks the family, "together with the patient, decided on the surgical option".

At operation, there was ascites and widespread metastases. A palliative transverse loop colostomy was performed. The anaesthetist notes "it was felt that once paralysed and ventilated it would be virtually impossible to get this patient off the ventilator, therefore a laryngeal mask was used and spontaneous ventilation". However following what was described as a gentle gas induction and 25 mcg of fentanyl, the blood pressure fell to 50/40 mm Hg. Towards the end of the operation the patient again became hypotensive and required inotropic support, which continued postoperatively. The patient continued to deteriorate and died 24 hours later in the HDU.

The surgeon's comment that the patient was frail but otherwise reasonably well would seem to indicate a limited understanding as to the significance of comorbidity on surgical outcome. Is not justifying of the decision to operate on the wish of the patient and family alone, an abrogation of professional responsibility? The undoubtedly difficult decision might have been better managed by wider professional involvement. If there was to have been even the remotest prospect of a successful outcome for the patient, then high quality critical care was going to be needed. A more formal part in the decision to operate should surely have come from critical care doctors together with the anaesthetist who might well have been able to have provided an objectivity that the surgeon and relatives clearly lacked. It is not enough to dismiss a case such as this as an inevitable death from inoperable carcinoma. If resources are to be used effectively and patients such as this are to die with dignity, then the decision to operate requires the most careful consideration and should include critical care doctors. In the three weeks between admission and operation there was plenty of time for this to have occurred.

In taking the decision to operate in complex cases, which will almost certainly require critical care and where there is a high probability of death, surgeons should directly involve critical care specialists in the decision to proceed. Their views may well assist in achieving a greater objectivity in these difficult circumstances. Local arrangements may need to be in place out of hours to achieve this.

Case Study 21

At 07.00, an 88-year-old female was admitted to the A&E Department with a ruptured abdominal aortic aneurysm. She was in hypovolaemic shock with a blood pressure of 55/35 mm Hg and a heart rate of 110. A massive transfusion was started as she was prepared for theatre but the blood pressure remained low and she became increasingly acidotic (pH 7.26). In theatre there was little improvement on the application of the aortic clamp. A Dacron graft was sutured in place but the patient developed a coagulopathy with widespread bleeding. Eventually the abdomen was packed and the patient was transferred to the ICU at 13.15 where she died just over two hours later.

It is inevitable that in emergencies of this type events take on a momentum of their own; the patient had a good past medical history and age alone cannot of itself be a contradiction to surgery. But, it is not difficult with hindsight to see that the outcome was inevitable. On the decision to operate the surgeon states "I spoke to the son pre-op, who clearly indicated that he would wish his mother to have an operation, fully aware of the possible outcome". For assent to be of value, it needs to be informed. On what basis could the son have been able to make a decision in such exceptional circumstances? Involving relatives in discussion and keeping them informed is essential, but it must be very difficult to find oneself part of a real life drama and required to make decisions when one's only previous experience of such events may have been in fiction. However in criticising the surgeon, it must be recognised that there was probably weakness by the anaesthetists in not taking a more active part in these decisions.

A short pause before proceeding and an opinion from critical care doctors with their broader experience might, one would suggest, have been of more value than giving unrealistic deference to the assent of the son.

Case Study 22

A 77-year-old woman was admitted under the care of a consultant physician with nausea, vomiting and constipation. She was noted to have hepatomegaly. Four days later, her general condition deteriorated and a perforated viscus was suspected when air was seen under the diaphragm on the chest X-ray. A consultant general surgeon advised urgent laparotomy and the patient was taken immediately to theatre. She was assessed by an anaesthetic SHO who thought her to be in septic shock on the basis of tachycardia, hypotension and a low oxygen saturation. The consultant anaesthetist was called but by the time he/she arrived the patient was already in the operating theatre. The anaesthetist considered that death was inevitable but, when challenged, the surgeon declared that he was only the technician required to open the abdomen and that he would leave the decision-making to the anaesthetic team. The patient was so sick that the consultant anaesthetist asked another senior colleague for an opinion. Eventually the abdomen was opened and a perforated tumour of the sigmoid colon was found. There was faecal peritonitis and hepatic metastases. A Hartmann's procedure was carried out. At the end of the operation, the patient was transferred to ICU but died after a short time.

Communication between the surgeon and anaesthetist appears to have totally failed. Surgeons should not abdicate from decision-making and should not coerce colleagues into anaesthetising unfit patients. In addition, the operation note received by NCEPOD for this case was extremely poor, being both incomplete and illegible.

This case is a further example of the abrogation of responsibility and an ineffectual team approach in a patient where the outcome of surgery and consequent death was never in doubt. The practice adopted in some hospital of utilising a multidisciplinary team approach with a formal meeting and discussion of complex cases prior to operation in those patients where there is time for such consideration, may well be beneficial when decisions have to be taken in an acute situation. A greater understanding of what others can provide and achieve is an essential aspect of working as a team.

The ability to work in teams is becoming a cornerstone of modern medical practice. The decision to operate in these difficult circumstances therefore needs to be a team decision rather than that solely of the surgeon.

PROBLEMS WITH DIAGNOSIS

Patients admitted under the care of physicians

Physicians need to raise their awareness of surgical conditions existing or developing in patients under their care.

Initial admission into a medical bed under the care of physicians of patients who were subsequently shown to have a surgical problem did, on occasion, result in unreasonable delay in making a diagnosis of the surgical condition.

Case Study 23

An 81-year-old patient was admitted under the care of the physicians having, as is recorded in the admission note, "gone off legs". During three weeks on the medical ward the patient who was passing faeculent urine, gradually became septic. There was a mass in the left iliac fossa, which was thought to be due to diverticulitis. A CT scan was carried out but was not able to differentiate whether the mass was indeed due to diverticulitis or carcinoma. The patient subsequently had a perforation of the colon secondary to a carcinoma of the sigmoid.

Case Study 24

A 75-year-old was admitted under the care of the physicians with general deterioration. The next day an X-ray of the abdomen showed free gas under the diaphragm and the patient was taken to the theatre. The creatinine was raised prior to the operation and the patient was considered to be ASA 5. At operation, purulent peritonitis was found which was due to a perforated diverticular abscess. A Hartmann's operation was performed and the patient transferred to the ICU postoperatively, but died the following day.

These two cases show both a delay in diagnosing the surgical condition and a general absence of urgency in the management of the patient.

Case Study 25

A 79-year-old lady was admitted under the care of the physicians with abdominal pain and vomiting. Four days later an abdominal X-ray showed small bowel obstruction. At operation, a strangulated left femoral hernia was found and a small bowel resection performed. The patient was transferred to the HDU but subsequently died.

It is not uncommon for a patient to be unaware of the presence of a femoral hernia and if strangulation occurs, it may be misdiagnosed as gastroenteritis. However, the hernia is usually detectable on clinical examination by careful inspection and palpation. Clearly physicians, as well as surgeons, need to be aware of this so that this condition, which is eminently correctable, can be diagnosed and treated.

Case Study 26

A 75-year-old male was admitted under the care of the physicians with epigastric pain and uncontrolled atrial fibrillation. The blood tests for Wegener's granulomatosis were strongly positive and the patient was started on a high dose of steroids and cyclophosphamide. Eight days later the patient complained of increasing abdominal pain and distension. At subsequent laparotomy there was widespread peritonitis due to gangrenous small bowel caused by a volvulus.

The scenario of a patient in hospital labelled with a firm diagnosis, who then develops a second condition, is well recognised. This case emphasises the importance of acting appropriately and promptly, in this case seeking the opinion of the general surgeons, when clinical features develop which are at variance with the established diagnosis.

Case Study 27

A 70-year-old female with diabetes and Addison's disease was admitted to a medical ward with a history of falls and fatigue. She was treated for a chest infection. Attempts at mobilisation proved difficult as she complained of pain in the hip, but it was not until nine days later that a diagnosis of fractured neck of femur was made. A hemiarthroplasty was performed. There was a failure in the management of her diabetes, possibly because the drug chart was not sent when the patient was transferred. and it was recorded that shortly before death the blood glucose had decreased to 1.3 mmol/l.

The care of this patient both in the medical and surgical ward was unsatisfactory. Only by recognising inadequacies in cases such as these through open discussion at multidisciplinary audit will those involved understand their responsibility for what occurred. In all probability only the clinicians at NCEPOD are aware of the level of clinical inadequacy in this case.

Appendicectomy

Appendicitis can still result in death in otherwise fit young patients. Its diagnosis requires skill and experience. Hospitals should ensure that those seeing potential cases either have the requisite skills and experience or are adequately supported by those who do.

There were twelve deaths in patients with appendicitis, but what is perhaps more alarming is that two of these were in previously fit young men, and another was a child aged three.

Case study 28

A previously fit 21-year-old male was seen in the A&E Department by an SHO five days before his ultimate admission. He had peri-umbilical pain and vomiting. It is not clear exactly why, but he was thought to have a urinary tract infection and was catheterised. At that time his pulse was 90 per minute, WBC 12.6, temperature 38.6°C and preliminary urine examination was normal. He was allowed home, but was re-admitted five days later moribund. He collapsed in the A&E Department, following vomiting, and had an asystolic cardiac arrest from which he was resuscitated and transferred to ICU. After ICU resuscitation he was taken to theatre where a gangrenous appendix and widespread peritonitis was found. An appendicectomy and lavage were performed but he died 24 hours later of ARDS.

Case study 29

A previously fit 22-year-old male was admitted with a seven-day history of abdominal pain associated with vomiting and diarrhoea. He had previously been thought to be suffering from gastroenteritis. His white count was 22,000. A working diagnosis of appendicitis with peritonitis was made. The patient was taken to theatre where a gangrenous appendix and pelvic abscess, with free pus throughout the abdomen, was found. Postoperatively he was sent back to the general ward and the next day had a sudden collapse and was transferred to the ICU where a diagnosis of septic shock was made. Despite full intensive care, on the following day he suffered a fatal cardiac arrest and died.

There is perhaps a tendency to look on appendicitis as a trivial condition, but these two cases show that it can cause death, even in previously fit young men. For these patients, it was the failure to make the diagnosis that resulted in delay. A patient presenting with abdominal pain, vomiting and pyrexia should not be sent home on the decision of an inexperienced SHO. In the second patient, the diagnosis was missed in primary care. Patients with appendicitis who develop a pelvic abscess can get symptoms very similar to a severe case of gastroenteritis and this needs to be more widely known both in general practice and among junior hospital staff.

In young children diagnosis can be even more difficult.

Case study 30

A previously fit three-year-old child was seen in the A&E Department of a district general hospital with a 24 hour history of pyrexia, vomiting and diarrhoea. The patient was obviously very unwell, being drowsy, floppy and breathless with a rapid pulse and a rigid abdomen. Transfer was arranged to a tertiary specialist paediatric unit. There was some delay in transfer and then there was no PICU bed immediately available. The patient was now dehydrated, in shock and acidotic. On arrival in the PICU, the patient was treated very actively with antibiotics, correction of the dehydration and acidosis. Increasing abdominal distension prompted drainage of the abdomen. When a peritoneal dialysis catheter was inserted, purulent fluid was washed out, but the patient was never made fit enough to have an operation. Despite inotropic support and antibiotics she became anuric and hyperkalaemic with increasing acidosis. Death followed asystolic arrest. At autopsy there was faecal peritonitis resulting from a perforated gangrenous appendix.

Other than the slight delay in transfer and in obtaining a PICU bed, it is difficult to know what more could have been done in this tragic case. Surgical trainees rarely see such severe cases but this acts as a reminder that small children can rapidly become desperately ill and indeed die as a result of appendicitis.

Vascular surgery

A leaking abdominal aortic aneurysm is a condition that may well be misdiagnosed. The consequences for the patient can be disastrous.

Case Study 31

A 78-year-old male was admitted with pain in the region of the left kidney but an intravenous pyelogram was normal. Three days later the patient collapsed and a diagnosis of ruptured AAA was made. The patient was taken to theatre but soon after clamping of the aorta, he suffered a cardiac arrest and died.

Attributing pain caused by a 'contained' leaking aneurysm to renal pathology is a common misdiagnosis. However, if the haemoglobin is low or an IVU has been performed and is normal, an aneurysm should be considered.

Case Study 32

An 85-year-old female was admitted as an emergency and was initially thought to have diverticular disease. In fact, the diagnosis of a leaking AAA was considered but no investigations were carried out. When the patient collapsed about twelve hours after admission she was immediately taken to theatre, but at operation a high neck was found and the aneurysm was considered to be inoperable.

An ultrasound scan is a simple way of aiding diagnosis, although a CT scan is to be preferred in showing whether or not there has actually been a leak. It also gives greater detail of the anatomy of the aneurysm.

Case Study 33

A 77-year-old male was admitted with pain in the right iliac fossa. The abdomen was slightly tender and rectal examination showed faecal loading. The House Officer diagnosed faecal impaction. Three hours later the patient collapsed and the true diagnosis of ruptured abdominal aneurysm was apparent.

Having the advantage of hindsight, it is important to recognise that such situations will always occur. However, early review of acute admissions by a more senior surgeon who might well be more suspicious and arrange for further investigation would undoubtedly be beneficial.

Investigations

The appropriate investigation can save a patient an unnecessary operation by enabling the correct diagnosis to be made.

Case Study 34

A patient who was on low molecular weight heparin (Clexane 80 mg) and aspirin 75 mg, was admitted with pain in the left iliac fossa and collapse. The patient was thought to have a left iliac aneurysm. A laparotomy was performed when, in fact, a spontaneous retroperitoneal haematoma was found but no evidence of an aneurysm.

Spontaneous retroperitoneal haematoma should be suspected in a patient receiving anticoagulants. More investigation, in conjunction with the resuscitation, might have avoided an operation and thereby could have given the patient a better chance of survival.

Case Study 35

A 62-year-old male had an ultrasound scan which showed a mass in the left kidney. An abdominal CT scan was subsequently performed and neither scan showed signs of spread so a nephrectomy was performed. The patient subsequently died and an autopsy showed multiple pulmonary metastases.

Careful examination of a chest X-ray might have prevented a fruitless operation.

Medical records

The failure to have available medical notes at a subsequent admission can compromise care and be directly detrimental to patient management. It is indicative of sub-standard care and should be audited as such.

NCEPOD has over many years criticised various failures in relation to the availability and maintaining of patients' medical records. This is not just an administrative problem. The following cases demonstrate that the lack of medical records or X-rays compromises the patient's management.

Case Study 36

This patient was admitted with a ruptured abdominal aortic aneurysm. In the absence of the medical records, which were missing, the clinicians involved were unaware that the patient had a carcinoma of the lung and a poor prognosis.

Had the notes been available the patient would not, in all probability, have been subjected to such an extensive operation as the repair of an aortic aneurysm.

Case Study 37

Following investigation with a barium enema and flexible sigmoidoscopy, a carcinoma of the sigmoid colon with complete obstruction was diagnosed. Two weeks later the patient was admitted with lower abdominal pain and constipation. The previous notes and X-rays were not available nor was the patient clear about his condition. The surgical team caring for the patient on this occasion was therefore unaware of the diagnosis and no operation was performed. A few days later when the patient perforated a viscus he was taken to the operating theatre but the clinicians had still not seen the original notes or X-rays.

An earlier operation would almost certainly have been performed if the notes and X-rays had been available and the outcome for the patient might have been very different.

Case Study 38

A 73-year-old lady underwent a mastectomy. 16 months prior to her admission she had had a myocardial infarction. She had also had two other admissions to the ICU with pulmonary oedema. In the absence of the medical notes the surgeons and anaesthetists were unaware of the severity of her condition. She died postoperatively as a result of left ventricular failure.

Pressures not to delay operations or extend the patient's stay in hospital can all too easily result in a decision to proceed even when there are fundamental failures in the organisation of patient care. The availability of a patient's medical records is essential.

TIMING OF OPERATION AND PREOPERATIVE PREPARATION

It is essential that all involved in the care of acutely sick patients who require urgent or emergency surgery should understand the appropriate balance between the need to get the patient to the operating theatre and the need to ensure proper resuscitation and investigation. Unnecessary delay is not acceptable. Good teamwork and mutual understanding is required between all those involved.

Case Study 39

A 78-year-old female was admitted to hospital at 02.00 with pain in the lower abdomen and signs of generalised peritonitis. She was cold, clammy and in shock. A diagnosis of a perforated viscus and peritonitis with septic shock was made. Intravenous fluids and antibiotics were given and the patient was taken to theatre at 04.00. Here, generalised peritonitis was found to be the result of a perforated appendix. Appendicectomy and peritoneal washout were performed. Postoperatively the patient was transferred to ICU, but despite all supportive care died of septic shock 48 hours later. During the operation the patient passed only 34 mls of urine.

The low urine output suggests that what preoperative resuscitation was given, was inadequate. Would it have been preferable if this patient had been admitted to ICU or HDU prior to the operation for rapid resuscitation and establishing adequate urine flow, prior to being taken to theatre?

A balance is required between the need to get an acutely sick surgical patient to the operating theatre and the need to ensure proper resuscitation and investigation.

For this to be achieved, planning, co-operation and teamwork between all those involved are essential.

Case Study 40

A 49-year-old male was admitted to a DGH under the care of the general physicians. He had a four-day history of a flu-like illness and increasing difficulty breathing. On admission there was neck swelling and trismus, he had bad teeth and a pyrexia. Intravenous antibiotics were administered, together with nebulised adrenaline. A decision was made to transfer him to the specialist maxillofacial hospital, but transfer did not occur for almost six hours. A staff grade surgeon was called in to see him at the maxillofacial hospital and diagnosed Ludwig's angina. The patient was transferred immediately to theatre for a tracheostomy. Fibreoptic intubation failed, as did an attempt at jet insufflation through a cricothyrotomy. An emergency tracheostomy was performed under local anaesthesia but the patient suffered a respiratory arrest and died.

Ludwig's angina is a surgical emergency requiring rapid surgical decompression and establishment of a definitive airway. One can only sympathise with the clinicians that had ultimately to manage this most difficult case. The six hour delay in transfer can only have added to their difficulties.