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Western Australian Audit of Surgical Mortality (WAASM)
Tasmanian Audit of Surgical Mortality (TASM)

Case Note Reviews
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Australasian and New Zealand Audit of Surgical Mortality

Royal Australasian College of Surgeons

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WHY SECOND LINE ASSESSMENT IS IMPORTANT

The hallmark process that lies at the heart of the Australian and New Zealand Audit of Surgical Audit Mortality (ANZASM) is that every death is peer reviewed. Even those where the surgeon states there has not been a problem. The external reviewers often identify issues not raised by the surgeon. The Annual Reports show that external reviewers identify almost double the number of Deficiencies of Care recorded by the surgeon. This should be of concern to all as it means that Deficiencies of Care are not being identified, and therefore cannot be corrected.

In WA both the Douglas Inquiry and the Medical Board have recommended that significant events be reviewed outside the institute in which they occurred.

The following vignette (one of many WAASM could provide) illustrates the importance of peer review

A patient underwent major surgery and died five days later from a pulmonary embolus (PE). The surgeon indicated heparin had been given prophylactically. On the WAASM proforma the surgeon stated there had been no adverse event.

Because PE has been a long-standing matter of interest to WAASM the patient's management was reviewed. The external assessor could not find any evidence that anticoagulation had been given pre-operatively, nor was there any entry on the anaesthetic chart. Although written up for postoperative heparin the 'square' on the drug chart for the evening of surgery was blank. It was not clear from the drug chart whether the dose on the first postoperative morning was administered as the notation is indecipherable – the entry could be a W (withheld) or a signature. The first dose of heparin given with certainty was on the evening of the first postoperative day – some 30 hours after the surgery started. There was no documentation as to whether either TED stockings or calf pumps had been used.

The external assessor felt that no deep vein thrombosis (DVT) prophylaxis had been given. From WAASM's point of view a PE is always recorded as an Adverse Event, and

if it causes a death it would normally be considered to have caused a death in a patient who would otherwise be expected to survive. WAASM recognised that if the prophylaxis had been given correctly the PE may not have been preventable. On the basis of what was recorded in the notes this patient had no DVT prophylaxis so the PE was considered preventable. It was recorded as category 5 under Health Round Table (HRT) criteria. WAASM forwarded the assessment to the surgeon in the usual way and added a note to the effect that as this appeared to be a system error it should be brought to the attention of the hospital.

A short while later the surgeon wrote to WAASM and stated 'we discussed this case at our medical quality meeting this morning and we are uncertain as to where the deficit in care is'. The implication, subsequently confirmed, was that absence of DVT prophylaxis had not been identified by the surgeon when he completed the proforma nor by the hospital when it reviewed this case at the time of death. It only came to the attention of the surgeon because the death was externally reviewed by WAASM and to the attention of the hospital because WAASM suggested the surgeon do this.

In order to complete the audit loop WAASM would like to report the findings of the hospital review. However, the hospital has advised WAASM it cannot provide a report as the review was conducted under Qualified Privilege legislation and as WAASM is not included in the hospital's coverage they will not be able to give any details with respect to any findings.

It is a requirement of the WA Department of Health under the Western Australian Review of Mortality (WARM) that any death categorised HRT 5 is reported to them. But for the external peer review undertaken by WAASM this death would not have been reviewed, and potential lessons missed.

RJ Aitken on behalf of WAASM

DELAY IN THE MANAGEMENT OF BILIARY PERITONITIS AFTER LAPAROSCOPIC CHOLECYSTECTOMY

Summary:

An elderly patient presented with obstructive jaundice presumed to be secondary to choledocholithiasis. Stones were present in the gall bladder and the common bile duct (CBD) was dilated. At endoscopic retrograde cholangiography a dilated CBD was confirmed but no CBD stones were seen. A sphincterotomy was performed.

The patient was re-admitted electively for laparoscopic cholecystectomy six weeks later. This procedure was performed by a consultant and advanced trainee and was apparently uneventful. The patient was discharged the same day. One week later the patient was readmitted via the emergency department with abdominal pain of a few hours duration. The provisional diagnosis was a bile leak. Computed tomography (CT) on the day of admission showed free gas and fluid consistent with this diagnosis.

It was decided to observe the patient overnight and to undertake a laparoscopy the next day if there was no improvement. The patient's condition deteriorated markedly overnight during which a number of intern reviews were conducted because of poor urine output. The day after admission further resuscitation and correction of coagulation was performed (the patient was on warfarin for atrial fibrillation). A laparotomy was carried out in the early evening (36 hours after admission). Biliary peritonitis was confirmed, but no source found. A lavage and drainage was carried out. The patient was transferred postoperatively to the intensive care unit where over the next few days the patient developed multi-organ failure. The patient died on the third postoperative day after withdrawal of supportive treatment.

Comment:

Four matters need to be considered:-

- 1) *The need for performing gall bladder surgery in an elderly patient.* The likelihood of recurrent jaundice was high, and so laparoscopic cholecystectomy does seem reasonable when balanced

against the risks imposed by the patient's co-morbidity, which were no higher than average for age.

- 2) *Were there technical issues at the first operation?* The operation note does not indicate any difficulty, or anatomical uncertainty. The documented time from knife-to-skin to dressings was 88 minutes, longer than might be expected for a consultant undertaking an uncomplicated case. That said, the subsequent laparotomy did not disclose a source for the bile leak, and it was specifically noted in the operation record "both clips *in situ* on cystic duct". Presumably this leak arose from the gallbladder bed and did not indicate technical error.
- 3) *Preoperative counselling in obtaining consent for the first operation.* An advanced trainee obtained consent in the outpatient clinic and the consent form includes bile leak among the risks discussed. No notes of the level of risk, if any, given to the patient are documented, but it does seem likely that appropriate discussion did take place.
- 4) *Was the second operation timely?* The correct diagnosis of a surgical complication was made clinically at this patient's second presentation, and this was confirmed by imaging that day. However, a decision was made to await events and during this time the sepsis became established and acute renal tubular necrosis ensued. Whilst conservative or endoscopic management of this complication is certainly possible, when the surgical team considered operative intervention to be likely there was little virtue in delay and this patient might have benefited from more expeditious treatment.

EXCESSIVE DELAY BEFORE SURGERY FOR PERFORATED LARGE BOWEL CANCER

Summary:

This elderly patient had a significant past history of pulmonary fibrosis plus many other minor co-morbidities including gastro-oesophageal reflux disease and gastroparesis.

Multiple medical and anaesthetic reviews reported that the patient had very poor exercise tolerance and was generally debilitated. The risk of death from surgery was considered high.

The patient presented to the general practitioner (GP) with a two-week history of abdominal pain, nausea and constipation. The GP ordered a CT scan that day which showed a large mass in the caecum and ascending colon, with extensive adjacent fat stranding and a second mass likely to represent mesenteric lymphadenopathy. A letter from the surgeon dated two days later informed the GP that he would organise a colonoscopy within the next fortnight. There were no examination findings mentioned in that letter. I get the impression that the patient was not seen by the surgeon in the outpatients, but the surgeon instead organised an urgent elective colonoscopy based on the GP letter and CT report.

On day four the patient was admitted the day before the colonoscopy for elective bowel preparation. I cannot find the colonoscopy report, but according to an inpatient note made by the surgical registrar, the endoscopist was unable to pass the scope beyond the sigmoid colon due to a tortuous colon. The tumour in the right colon was therefore not visualised or biopsied. The surgeon requested a barium enema, but the radiologist stated this was not possible due to presence of the bowel preparation. The surgeon booked an elective right hemicolectomy for day 18 after the CT scan.

The patient stayed in hospital and was reviewed by the medical and anaesthetic teams in preparation for surgery. Both teams considered the patient to be at high risk. Intensive Care Unit / High Dependency Unit (ICU/HDU) monitoring was recommended for postoperative care.

A review by the medical team on day 12 suggested the patient may have had a chest infection (white cell count (WCC) 24,000). On the medical registrar's instruction a septic screen was undertaken and antibiotics started. Blood cultures grew *Bacteroides fragilis*. The infectious disease team was consulted and the source was likely to be secondary to a microperforation of the right colonic cancer.

The patient was started on intravenous (IV) vancomycin and metronidazole in addition to ciprofloxacin.

On day 16 the WCC had increased to 36,000. The plan by both anaesthetic and surgical teams at that stage was to still go ahead with elective surgery three days later. The infectious disease team also reviewed the patient on day 16 and were concerned that the patient's intra-abdominal sepsis was not adequately controlled by multiple antibiotics. They told the surgical team earlier intervention was required. A different surgeon (from the one in charge of the patient) reviewed the patient that night and undertook an emergency laparotomy (day 16).

At laparotomy there was a perforation of the transverse colon as well as at the tumour site, resulting in gross faecal peritonitis. The tumour was extensively infiltrating the mesentery. The right colon was mobilised and the tumour resected. However, the patient became increasingly hypotensive and coagulopathic, presumably due to the sepsis. The patient died on the table. The pathology of the resected bowel showed a large poorly differentiated adenocarcinoma involving the caecum and ascending colon, which had a 2.5cm perforation within it, and also a second 2cm perforation in the colon, distal to the cancer.

Comment:

I note:-

- 1) The patient's WCC was already elevated at 17,000 when tested by the GP. Blood tests taken after the colonoscopy showed WCC of 30,500 with neutrophilia of 27,000.
- 2) When examined by the surgical team on the day of the colonoscopy the patient was tender over the right iliac fossa (RIF) mass, although there was no mention of peritonism. RIF tenderness and sometimes generalised tenderness with distension were recorded as part of the examination findings on a daily basis during the patient's stay in hospital.
- 3) The CT scan noted extensive fat stranding around the tumour.

- 4) Blood cultures grew *Bacteroides fragilis*, a colonic organism, further supporting the likelihood of colonic perforation.

The combination of the above should have raised the suspicion of impending or early perforation of the tumour, which would normally be reported to the surgeon in charge who should then have examined the patient. I cannot find any documentation to indicate that the patient was examined by the surgeon-in-charge at any stage of the admission. With a likely perforated cancer bowel preparation, and more so a colonoscopy, would be considered unsafe. The second more distal perforation in the colon may have been a result of barotrauma from gas instilled during the attempted colonoscopy.

The patient should have had a semi-urgent operation within two to three days of admission and not been planned for an elective operation two weeks later. This death may have been avoided if the patient had surgery before becoming so septic that multi-organ failure developed during the operation.

DVT prophylaxis was not used at all during the whole admission. This patient was at high risk of DVT and prophylaxis should definitely have been used.

DELAYED RECOGNITION OF JEJUNAL PERFORATION

Summary:

An elderly patient was involved in a low-speed head-on motor vehicle accident. The patient had severe co-morbidities including an implantable defibrillator and ischaemic heart disease treated with a stent. The patient was on clopidogrel. On presentation to the emergency department the patient had a patent airway, but obvious rib fractures with a flail chest and fractured sternum. The blood pressure and pulse were stable with a Glasgow Coma Score (GCS) of 15. Left upper quadrant tenderness was noted and the initial chest x-ray showed severe contusion. With an oxygen saturation (SaO₂) of 85% and partial pressure oxygen (pO₂) of 61.9, the patient was electively intubated and an intercostal catheter placed on the left side.

An ultrasound scan revealed free intra-peritoneal fluid that was apparently confirmed on CT (formal report not in the notes). The CT showed a splenic laceration and may have shown active extravasation. An electrocardiogram (ECG) raised the possibility of a myocardial event. The patient was reviewed by the consultant and admitted to the ICU for conservative management.

In the ICU the patient became hypotensive and developed arrhythmias requiring inotropes and amiodarone. Cardiac enzymes suggested a myocardial event. 24 hours post-accident the patient's abdomen remained soft. However, the patient was still hypotensive, and an echocardiogram showed an under-volumed and poorly functioning heart. Subsequent volume expansion was unsuccessful and the patient became oliguric. 30 hours after admission a laparotomy was performed by the consultant. A perforated jejunum with a small amount of bile-stained fluid was found, along with a contained splenic laceration. The perforation was oversewn and a splenectomy was performed. The patient was returned to the ICU with further increasing inotropes. The patient was markedly acidotic and still anuric. A decision was made to not escalate treatment and the patient died 41 hours post-admission.

Comment:

I do not feel that a major adverse event has occurred in the management of this patient. It would appear that the patient suffered a myocardial event and primary pump failure rather than a septic death from the delayed recognition of the perforation. Small bowel perforation following blunt trauma is well recognised, but not common (less than 1%). The patients generally present with peritonism or free air on imaging. However, it is difficult to diagnose using CT scan and ultrasound.

One consideration is that a mesenteric haematoma and subsequent ischaemic perforation can cause a delayed rupture. This patient initially had no peritonism. Unfortunately the formal CT report was not in the notes and the several entries in the notes have interpreted it differently. The final decision for laparotomy appears to have been to find ongoing bleeding rather than a cause

for sepsis. With this patient's co-morbidities and injuries it is doubtful that any different outcome would have been observed even if the patient had been taken to the theatre immediately. Certainly there were no adverse events or decisions leading to the death.

This case does raise two issues in regards to the missed injuries:

- 1) *The accuracy of serial clinical exams in an intubated patient.* According to some studies, these exams have little accuracy; therefore, a low threshold must be held when re-imaging polytrauma patients who are deteriorating.
- 2) *Understanding the limits of your investigations.* FAST and CT can both diagnose fluid, not the content of the fluid. It is possible that a diagnostic peritoneal lavage may have revealed the fluid content and led to an earlier diagnosis.

This case also highlights the need for care in recording hospital notes. The consultants' operation findings of bile-stained fluid and blood, to be expected from the upper small bowel perforation, was reported as faeces throughout the peritoneal cavity in the ICU notes.

DEATH FROM MYOCARDIAL INFARCTION FOLLOWING OFF PUMP CORONARY ARTERY BYPASS SURGERY FOR ACUTE INSTENT THROMBOSIS

Summary:

A middle-aged patient with a history of ischaemic heart disease had been treated six years previously for an acute myocardial infarction by acute stenting with a bare metal stent. Further stenting of a left anterior descending (LAD) coronary artery diagonal bifurcational lesion with a bare metal stent was also performed, followed sometime later by further stenting (either bare metal or coated) of the circumflex and marginal arteries.

On this occasion the patient presented with unstable angina. The patient was on aspirin and clopidogrel. The patient was booked for urgent coronary artery bypass grafting. Clopidogrel was stopped one day preoperatively and no aspirin was taken on

the day of surgery. Both aspirin and clopidogrel were resumed from day one onwards. The patient underwent four vessel OPCAB using saphenous vein. Postoperatively there was difficulty in weaning the patient from the ventilator, probably secondary to the patient's morbid obesity. The patient also had moderate chronic renal failure and required continuous veno-venous haemodialysis (CVVHD) for two days postoperatively.

The patient was transferred to the ward six days postoperatively and was making reasonable progress. Three days after this the patient suffered acute further chest pain, which did not settle, and the troponin began to rise. The patient was re-catheterised and was found to have thrombus occluding the left main coronary, LAD and circumflex arteries and occluded vein grafts to the diagonal and posterior descending. The patient underwent catheter thrombectomy and stenting to re-perfuse the myocardium. Despite an intra-aortic balloon pump and high levels of inotropes, myocardial function deteriorated. The patient developed multi-organ failure and died 24 hours later.

Comment:

This case demonstrates the problem in dealing with coronary stents when further surgery is undertaken. Following OPCAB there is an increased thrombotic tendency. Despite early re-introduction of anti-platelet agents, this patient developed acute thrombosis of the coronary stents that occluded the left main coronary and LAD and circumflex arteries, resulting in a large postoperative myocardial infarction.

I do not think that there were any adverse events in the management of this case. It does raise the question of what to do with vessels that have been stented and have no significant stenosis at the time of requiring further coronary surgery. There may be an indication to graft vessels even though they are not stenosed. Also it may be unwise to perform OPCAB on patients with previous stents to vessels that are not to receive bypass grafts. This is a contentious and debatable situation.

DEATH AFTER HERNIA SURGERY – WAS SURGERY REQUIRED?

Summary:

A middle-aged patient underwent a repair of a right direct inguinal hernia under general anaesthetic. An experienced registrar performed the operation using a mesh. The patient had multiple extensive co-morbidities, including end-stage renal failure from a failed transplant requiring haemodialysis, various vascular problems and a red cell dyscrasia. The consultant surgeon had referred the patient for a preoperative anaesthetic opinion, and because of the patient's slight build offered to repair the hernia under regional or local anaesthetic.

In the days following the hernia repair the patient became progressively unwell and developed abdominal pain. This was rather non-specific and four days post surgery the patient was discharged. Four days later the intensive care unit admitted the patient, who was now very unstable, with a metabolic acidosis and a lactate of 5.9. On clinical examination the patient had an acute abdomen. The patient was seen by another experienced surgical registrar who noted at 20:00 hours that a laparotomy would not be helpful and that the patient's mortality would likely be close to 100%. The registrars recorded that the consultant agreed. However two hours later a laparotomy was performed.

The findings were of serosanguinous fluid and extensive adhesions from the previous surgery. The registrar found it difficult to mobilise the bowel because of the dense adhesions and one inadvertent enterotomy was repaired. The registrar noted "but in ischaemic bowel therefore likely to leak early". The operation note further recorded "conclusion inoperable condition". The patient was returned to the ward.

A week later there was a leak and a second laparotomy was performed by the consultant. Copious amounts of faeculent fluid were found throughout the abdomen. The consultant appears to have struggled to mobilise the small bowel and a 25 cm section was eventually resected. No areas of dubious vascularity were seen and the small bowel was re-anastomosed. A lavage was carried out and multiple drains placed into the

abdomen. Following this laparotomy a decision was made to support the patient, but not to offer further surgery. The patient made good progress, but two days later developed a gastrointestinal fistula through the midline abdominal wound. During the next week the patient made good progress initially without any peritonitis, but subsequently developed increasing pain and tenderness with a rise in the white cell count and C-reactive protein (CRP). A CT scan showed intra-peritoneal leakage of the contrast. The consultant therefore elected to return the patient to theatre. The small bowel content found throughout the abdomen had come from a completely dehiscenced small bowel anastomosis. Once the small bowel loops had been freed an ileostomy was raised in the left iliac fossa.

The patient's progress over the next four months was prolonged and difficult. The patient was eventually discharged from the surgical ward for long-term rehabilitation. There the patient had numerous episodes of hyperchloremia probably related to chronic renal failure and had numerous MET calls and at least one ventricular fibrillation arrest. The patient subsequently died from a further ventricular fibrillation arrest.

Comment:

There are a number of issues that need to be considered here:-

- 1) Was it necessary for a high-risk patient to have a direct inguinal hernia repaired as the risk of surgery may have outweighed the risk of strangulation?
- 2) Given the high risk it is not clear why the patient underwent the operation under general anaesthetic rather than regional or local anaesthesia.
- 3) It was not clear what caused the patient's medical status to deteriorate prompting the first laparotomy. The probability is that it was ischaemia of the small bowel, which was presumably a consequence of the patient's medical status. The registrar could have benefited with consultant support at this operation.
- 4) The enterotomy leaked, presumably secondary to ischaemia. Was a further

5) Despite these surgical problems, the patient survived and was eventually discharged to the surgical ward. The patient died whilst undergoing rehabilitation. It would appear that this death was not a direct result of surgery, although presumably the patient's complex postoperative course made the patient susceptible to various co-morbidities.

SURGICAL RISKS ASSOCIATED WITH OBSTRUCTIVE SLEEP APNOEA

Summary:

A middle-aged morbidly obese patient with a body mass index (BMI) in excess of 40 and a past history of obstructive sleep apnoea and asthma underwent anterior cervical spine surgery for cervical spine stenosis and early cervical myelopathy. There was a minor complication of the surgery at the time of operation resulting in a dural laceration. There is no evidence that this played a part in the patient's demise.

In the general ward the patient's condition remained satisfactory although it was noted that the patient was drowsy in the afternoon on the first postoperative day. At 21:30 hours the patient's oxygen saturation was down at 73% with continuous positive airway pressure, but improved to 96% with nasal prongs. The patient was next reviewed at approximately 04:00 hours the following day and was found to be unresponsive. The patient failed to respond to resuscitation measures. It is noted that the patient used patient-controlled analgesia and over a period of 33 hours received a total dose of 176mg of morphine that equates to roughly 5mg per hour.

Comment:

It is unlikely in my opinion that this case represents a true complication of surgery. Despite the significant risks in a patient of this type, the operation, apart from a dural tear, seemed to progress uneventfully. I assume the respiratory arrest was related to the obstructive sleep apnoea and was perhaps

contributed to in some part by the dose of morphine received. In my opinion the view of either of a respiratory physician or anaesthetist may help avoid this kind of outcome in the future.

If the patient had been nursed postoperatively in either the intensive care or high dependency unit the respiratory arrest would have been determined when it occurred. It would be appropriate to have patients assessed preoperatively with a view to determining if such a high level of observation is deemed necessary on a clinical basis rather than on the basis of diagnosis alone.

FAILURE TO RECOGNISE AN IN-HOSPITAL FALL

Summary:

An elderly patient was admitted with a Garden grade 1 undisplaced fracture of the neck of femur (#NOF) after a fall at home. The patient had numerous medical co-morbidities, as a result of which a decision was made to treat the patient conservatively. The patient made good progress and eight days later had a trial home visit with the occupational therapist.

On the ninth day a further x-ray showed some movement in the #NOF, but as the patient was walking with a frame no surgery was planned and plans were in hand for discharge. At about 01:30 hours on the tenth day the patient fell. A subsequent examination revealed pain in the hip. An entry notes that as a result of the fall the #NOF became a displaced Garden grade 4.

In view of this, surgery had to be undertaken. As anticipated (and discussed with the patient and family) the patient had a stormy postoperative course and died from co-morbidities some 12 days later.

Comment:

This death was reported to the coroner in a letter from the hospital medical services, which implied that the surgery was prompted by the x-ray on the ninth day, rather than the in-hospital fall that caused the fracture. This in-hospital fall should have been recorded as

an adverse event and included in the information to the coroner.

INADEQUATE DVT PROPHYLAXIS LEADS TO PULMONARY EMBOLUS

Summary:

An elderly patient was admitted for a knee replacement. The operation proceeded uneventfully and the patient's initial recovery was unremarkable. In the middle of the sixth postoperative day the patient was assisted to the toilet. A short while later the alarm was sounded. When answered the patient was found collapsed. Resuscitation was unsuccessful. No postmortem was undertaken.

Collapse following a call to stool is a classical presentation of pulmonary embolus (PE). Although a PE was considered the likely diagnosis by the medical officer attending the arrest call, it does not appear to have been considered as a possible diagnosis by the surgeon. The surgeon indicated that subcutaneous heparin was used as a DVT prophylaxis. On the medication chart the first dose of subcutaneous heparin appears to have been given some 30 hours after the commencement of the surgery. The nurse progress chart suggests that a foot pump was used on the operation day, but thereafter neither a pump nor anti-embolic stockings were used.

Comment:

Knee surgery is a high-risk procedure for DVT and PE, and DVT prophylaxis must be administered in a timely fashion. Presumably prophylactic subcutaneous heparin was the surgeon's intended antithrombotic management but it does not appear to have been administered as ordered.

A GASTROSCOPY MIGHT HAVE PREVENTED A LAPAROTOMY

Summary:

A middle-aged patient was admitted to hospital with a four-week history of non-specific abdominal pain. Investigations included a CT scan that showed some thickening of the stomach wall. A previous ultrasound had shown some free fluid within

the abdomen. Two days later the patient underwent a laparoscopy. Free fluid was noted, as were deposits in the pelvic peritoneum and across the abdominal wall. The right ovary was normal, but the left ovary was not seen because of adhesions. Multiple biopsies were taken and fluid sent for cytology.

The histology suggested that these were reactive cells secondary to severe, acute and chronic inflammation. There was no suggestion on either the histology or cytology of malignancy. The patient's cancer antigen (CA) 125 was marginally elevated. The patient was discharged home 48 hours later. The patient was re-admitted under the care of a different surgeon 14 days later having been transferred from another hospital where a diagnosis of diverticulitis had been made. A further CT scan showed a lot of free fluid within the abdomen with matting of the omentum and small bowel.

The following day the patient underwent a laparotomy. The findings were of advanced pelvic malignancy throughout the abdomen that actually made a full laparotomy difficult. Multiple biopsies were taken and a loop ileostomy brought out to solve the problem of pelvic obstruction. While under the same anaesthetic the patient had an upper gastrointestinal (GI) endoscopy that revealed a large malignant ulcer on the lesser curve of the stomach. Unfortunately the ileostomy did not solve the problem of small bowel obstruction. The patient commenced palliative care and died about three and a half weeks later.

Comment:

If the diagnosis of gastric malignancy could have been made at the time of the patient's initial presentation a laparotomy, and perhaps even the laparoscopy, could have been avoided. The initial CT scan suggested that the stomach was not normal and the laparoscopic appearances would certainly have been in keeping with a gastric carcinoma, even if the biopsies subsequently were proven to be negative for malignancy.

A gastroscopy before or after the laparoscopy would have confirmed the diagnosis, and established that a laparotomy was unlikely to

be helpful. It obviously would have not altered the outcome.

RADICAL CARE FOR PATIENT WITH WIDESPREAD PANCREATIC CANCER

Summary:

An elderly patient was admitted with a one-week history of right upper quadrant (RUQ) pain that radiated to the tip of the shoulder. On initial assessment there was a palpable mass in the RUQ. An ultrasound reported 'diffuse liver involvement with apparent metastatic disease'. A core biopsy suggested pancreatic cancer. This prompted a CA 19-9 assay that was returned at 500,000. One week later the patient underwent an upper and lower gastrointestinal endoscopy where no obvious abnormality was found. A medical oncologist elected to treat the patient with chemotherapy. On the evening of day 14 the patient fell and an x-ray on day 15 showed an inter-trochanteric fracture of the left hip. After discussion with an orthopaedic surgeon arrangements were made for the patient to go to hip surgery two days later. On the day between the fall and hip surgery the patient was taken to theatre for insertion of an infusaport.

After the hip surgery the patient initially made good progress. However on day 31 the patient developed further abdominal pain that was thought to be biliary colic. A further ultrasound showed a contracted gall bladder with multiple gallstones. The patient was reviewed by the original admitting surgeon who elected to treat the patient conservatively. Over the next three days the patient continued to have pain and a further CT scan was undertaken on day 35. This reported 'innumerable metastatic deposits throughout the liver'. There was no obvious abnormality related to the gall bladder.

The patient did not appear to be settling and underwent a cholecystectomy on day 36. The laparoscopy was converted to an open procedure and once the contracted gall bladder had been mobilised a cholecystoduodenal fistula was identified. The gall bladder had been partly replaced by tumour and once it was removed the defect in the duodenum was repaired. Because the patient's progress was slow a further CT scan

was conducted on day 43 and there was now evidence of tumour necrosis within the metastatic disease. There was a moderate amount of peritoneal fluid, but also an abnormal area of thickened small bowel underneath the liver. It was elected to treat this conservatively with antibiotics and intravenous albumin.

On day 58 the patient developed diplopia and, as no obvious cause was found, underwent a magnetic resonance imaging (MRI) of the head that revealed no evidence of intracranial metastatic disease. In particular there was no explanation for the sixth nerve palsy identified on clinical examination. During the next two weeks the patient's health fluctuated. By day 73 the patient's general health was deteriorating and a decision was made to convert to palliative care. The patient died 48 hours later.

Comment:

A number of issues merit comment:

- 1) An elderly patient with widespread metastatic hepatic metastases from pancreatic cancer probably has an average life expectancy (without treatment) of less than three months. It is unlikely that chemotherapy would have any material impact on this elderly patient's life expectancy. Palliative care could have been offered from the moment the diagnosis was secured.
- 2) In these circumstances the fall and fractured hip would seem to be a terminal event. Once again the patient could have been treated comfortably and without surgery. Once hip surgery had been decided upon, the infusaport could have been inserted at the same time rather than as an additional procedure the day before.
- 3) When the patient deteriorated because of an inflamed gall bladder there would have been a further opportunity for palliative care, rather than major surgery. The patient eventually died 10 weeks after the diagnosis of metastatic pancreatic carcinoma was made. This is what would have been anticipated if the patient had received no treatment.

The surgeon completing the proforma was the orthopaedic surgeon who performed the operation some three and a half weeks before the cholecystectomy. The orthopaedic surgeon did not record that the patient had had a fall (which would be an adverse event) and presumably did not review the notes at the time of completing the proforma as he would have otherwise been aware of the subsequent cholecystectomy which was probably more relevant to the cause of death.

ELECTIVE ILEORECTAL RESTORATION PERFORMED FOLLOWING SUBTOTAL COLECTOMY FOR ISCHAEMIC BOWEL IN A HIGH-RISK PATIENT

Summary:

An elderly patient presented with a nine-month history of blood-stained diarrhoea, vomiting and right abdominal pain. The patient underwent a subtotal colectomy for ischaemic colitis extending from the caecum to distal transverse colon. The procedure was complicated by atrial fibrillation and myocardial infarction. The patient then developed a high ileostomy output that led to acute-on-chronic renal failure. This was difficult to manage conservatively. Two months later an attempt was made to reverse the ileostomy, but at operation a pelvic abscess was encountered which was drained. The ileostomy was re-fashioned, but no anastomosis performed.

Postoperatively, the patient developed atrial fibrillation and a non ST-elevation myocardial infarction and was transferred to an intensive care unit. Coronary angiography showed significant coronary artery stenosis that was managed medically and the patient was discharged. Four months later an ileorectal restoration was undertaken. Following extensive adhesolysis, the ileostomy was taken down and an ileorectal anastomosis established. Following surgery an initially unexplained metabolic acidosis developed which worsened postoperatively with hypotension, septic shock and subsequent signs of peritonitis.

Laparotomy revealed an intact anastomosis, but there was extensive faecal contamination from a perforation of distal ileum due to ischaemic necrosis with a reduced pulse in

the superior mesenteric artery. The area of perforation was brought out as an ileostomy and the abdomen lavaged, but the patient's condition deteriorated and the patient passed away the following day.

Comment:

There are several issues of concern with the management of this patient. Although there was patient and family pressure to re-operate due to high ileostomy output and renal failure, it is not clear that restoration with an ileorectal anastomosis would have corrected the problem with fluid re-absorption. It is also possible that the high output was a manifestation of subacute small bowel ischaemia.

From the outset it appeared that the patient's ischaemia was in the territory of the superior mesenteric artery. Having decided to proceed with reversal it would have been appropriate to undertake preoperative mesenteric angiography (CT or percutaneous) and consider stenting to re-establish blood flow.

Despite the high risks of further surgery, another attempt was made at restoration after the patient suffered a myocardial infarction following the pelvic abscess drainage. The cause of on-table metabolic acidosis could have been recognised as gut ischaemia given the preceding history. Restoration could have been abandoned a second time.

RELIANCE ON RADIOLOGICAL IMAGING IN A POSTOPERATIVE PATIENT

Summary:

An active elderly patient presented with a two-week history of abdominal pain and vomiting, consistent with an incomplete small bowel obstruction. Relevant was a history of an abdomino-perineal resection with adjuvant radiotherapy for rectal carcinoma some 20 years earlier. The patient had subsequently developed a small bowel obstruction due to a fibrotic stricture in the previously irradiated proximal jejunum, which required resection 14 years later.

The patient was initially investigated as an outpatient and by the time a high-grade recurrent jejunal stricture was confirmed with a contrast study the patient had been

tolerating little more than fluids for over four weeks. The scheduled laparotomy was difficult by virtue of extremely dense small bowel adhesions, no doubt exacerbated by radiation fibrosis. A significant length of small bowel was resected, and a single anastomosis constructed. Some serosal tears were oversewn and saline lavage performed.

The patient was managed in an ICU postoperatively. The patient's condition was satisfactory when reviewed on the first postoperative day by the operating surgeon. Formal arrangements were made to hand over the patient's care to a colleague for the next three days. On the second postoperative day there were clear indications that all was not well including increased abdominal distension, marked positive fluid balance, neutropenia and a rising creatinine level. The covering surgeon was called several times by the ward and nursing staff, but did not attend the patient. The covering surgeon discussed a CT scan report with the radiologist, but the findings were reported as nonspecific and supportive treatment was continued.

When the operating surgeon returned on the fourth postoperative day the septic condition of the patient was recognised and at immediate re-laparotomy an enteric leak proximal to the anastomosis was found. The patient required a further laparotomy for another enteric leak five days later and two further washouts. Inexorable deterioration occurred and on the twelfth postoperative day the patient required a substantial resection of the minimal remaining bowel with an end defunctioning ileostomy. The patient was transferred to a tertiary hospital for further ICU care, but despite full support the patient's condition steadily declined till death approximately five weeks postoperatively.

Comment:

This patient posed a formidable management challenge from the outset. Postoperative care could not be supervised 'in absentia' and clinical assessment by the delegated surgeon was unquestionably necessary. However, the likelihood of this patient surviving a significant complication was slim and the outcome may have been little changed by earlier intervention.

SEDATIVES MAY HAVE CONTRIBUTED TO DEATH

Summary:

An elderly patient presented in the evening with a displaced capital fracture. The patient had a past history of alcohol-induced dementia, delirium, hypertension, Type II diabetes and transient ischaemic attacks. The patient was in some degree of discomfort. Intravenous morphine was provided in the emergency department and subsequently a femoral nerve block was provided. The patient underwent a cemented hemiarthroplasty under spinal analgesia with antibiotic cover within 24 hours.

The early documentation shows the patient had low oxygen saturation on air and was dependant on oxygen to maintain saturation above 95% throughout admission. On day three postoperatively the patient developed a pyrexia with low oxygen saturations of around 88% on room air. The orthogeriatric unit was involved with the management of the presumed chest infection. The patient was initially commenced on intravenous timentin and subsequently metronidazole. Ciprofloxacin was later added as there was a suggestion of possible aspiration pneumonia. The patient was kept comfortable throughout the period of postoperative recovery. The patient passed away 12 days following hip surgery.

Comment:

The provision of a combination of narcotic and diazepam can reduce a patient's respiratory efforts. This combination may have contributed to postoperative respiratory problems.

POSTOPERATIVE PANCREATITIS LEADS TO DEATH AFTER ANTERIOR RESECTION

Summary:

An elderly patient underwent an elective low anterior resection for carcinoma of the middle third of rectum. The pancreas was damaged during mobilisation of the splenic flexure and the resultant haemorrhage was difficult to control. Control was temporarily achieved with packs, but the patient developed postoperative pancreatitis with a pancreatic fistula. The patient developed intra-

abdominal sepsis and multi-organ failure and died 36 days after admission despite several further laparotomies.

Comment:

One area of concern highlighted by this case is the importance of full and legible notes. Preoperatively, the patient was stated to be high risk but there is no surgical admission note. It is therefore hard to make a thorough preoperative assessment of risk but the patient had an admission for a lower respiratory tract infection 19 days before, which required a short course of high-dose steroids. The anaesthetic assessment says the patient could not manage one flight of stairs. It is mentioned that the patient was overweight, but no weight or BMI is documented. These factors would have informed the decision to operate, the timing of the operation and the choice of operation with a long midline incision and splenic mobilisation.

The operative notes are hard to decipher and the reviewer would like to reiterate the recommendation that typed comprehensive operation notes are preferred. The perception that there was “general ooze” contrasts with the registrar’s entry that states there was bleeding from the pancreatic bed rather than the pelvis, the usual site for bleeding in anterior resection in patients prone to bleeding. This suggests significant pancreatic damage during mobilisation. Spontaneous postoperative pancreatitis can occur but it is rare in colonic surgery and rare in association with steroid use. The reviewer believes that pancreatic damage is a much more likely aetiology in this case.

Fluid balance was an issue in this case. By the twenty-fifth day after admission the patient was 22.4 litres positive. It is acknowledged that in the presence of multi-organ failure, fluid resuscitation is required, but in a patient with pulmonary problems and preoperative documented pulmonary hypertension these volumes are very significant. It is noted that albumen was used but in the absence of any blood results further analysis is impossible.

EXCESSIVE USE OF NARCOTICS IN THE ELDERLY MAY RESULT IN MENTAL DETERIORATION, IMMOBILITY AND DEATH

Summary:

An elderly patient underwent manipulation to the right knee under general anaesthetic (GA) for a fixed 30° flexion deformity and limitation of flexion, following total knee replacement 15 months previously. During the first three postoperative days the patient required three litres of oxygen via nasal prongs, but after this period maintained adequate pO₂ on room air only, up to the eighth day, when pO₂ dropped sub-acutely. On day 11 the patient was diagnosed with acute interstitial lung disease and transferred to the intensive care unit on Bi-level Airway Pressure.

The patient initially responded to prednisolone, meropenem and azithromycin, but the type 1 respiratory failure intensified, which required intubation on day 21 and, eventually, tracheostomy on day 28. The patient died 33 days post-anaesthetic.

Extensive investigations resulted in the final diagnosis of respiratory failure secondary to “a bilateral interstitial process of reticulo-nodular pattern”, most likely of infective nature.

Comment:

If pulmonary function was a concern preoperatively, the patient could have had an epidural or regional block, or local anaesthetic, rather than GA.

The final cause of death was an acute/subacute interstitial (infiltrative) inflammatory process, rather than the ‘pulmonary fibrosis’ entered on the form, which is a chronic condition of slow progression. The anaesthetic, per se, would have had little direct effect on the patient’s lung function (laryngeal mask airway, spontaneous respiration with O₂ only, midazolam, fentanyl, propofol and an anaesthetic of very short duration).

The patient had a pre-admission status of marginal cerebral perfusion, chronic obstructive pulmonary disease and hypothyroidism. Before his respiratory illness set in, the patient complained profusely about pain in the knee despite no

clinical adverse findings. Immediately postoperatively the registrar decided against femoral block and advised the use of oxycontin. Medical staff describes a progressive deterioration in the patient's mental state, e.g. anxiety and depression, which could have been caused by the intravenous anaesthetic agents and postoperative oxycodone (this led to a significant drop in pO_2 in the first three postoperative days). Oxycontin was given prior to physiotherapy sessions to alleviate pain, but the drug then rendered the patient immobile. The patient also experienced respiratory depression and depression of the cough reflex.

For cognitive function, I believe that the final outcome may have been different if spinal/epidural anaesthetic, femoral nerve block and non-narcotic analgesics (possibly in combination with non-steroidal anti-inflammatory drugs) were used instead. From the well-presented case notes, the depth of consideration given to the patient's medical problems indicated that a reasonable care pathway had been adhered to.