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WESTERN AUSTRALIAN AUDIT OF SURGICAL MORTALITY

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Case 1: Colonoscopic perforation I – inappropriate delegation results in misdiagnosis and delay

Summary

An elderly patient underwent a colonoscopy for new onset bloody diarrhoea; Crohn's colitis was diagnosed. Patient was subsequently reviewed by the admitting consultant physician (not the endoscopist) because of distension and pain. An erect abdominal x-ray (AXR) was ordered; the AXR was reviewed by a medical officer (non-radiologist) who advised the consultant there was no free air under the diaphragm. When reviewed the next day, the patient was not unwell, but was 'not right'. The notes suggested that the medical staff were reassured because the measurement of the abdominal girth had remained unchanged.

Shortly thereafter, the radiologist's formal report on the AXR noted that the x-ray showed air under the diaphragm. The patient was transferred to a larger hospital where a repeat AXR and chest x-ray (CXR) were performed, showing air in the peritoneal cavity. A laparotomy was commenced and a subtotal colectomy and ileostomy were undertaken by an unsupervised senior trainee. The patient had a difficult postoperative course and died from sepsis, several days later. The death was reported to the Coroner, but not investigated further.

Reviewer's comments

The cause of death was likely to be colonic perforation. This was an adverse event, but is a recognised complication of colonoscopy and was probably not preventable. The critical event was the misdiagnosis of the AXR and the resultant delay in dealing with the perforation, which could be classified as an adverse event and preventable.

It would seem that the initial AXR was interpreted incorrectly. Air under the diaphragm can be subtle; had the original AXR been interpreted correctly, the surgery would have been 12-15 hours after the colonoscopy and the outcome may have been different.

Hospitals and surgeons should be mindful of the need for appropriate x-ray review after-hours and should perhaps consider the use of picture archiving and communications systems (PACS) to have films reviewed by an off-site radiologist.

The delay in diagnosis may have been compounded by a several hour delay after transfer. Abdominal girth measurements were shown in several studies over 30 years ago to be inadequate at diagnosing colonic perforation as they are not reproducible.

Case 2: Colonoscopic perforation II – delay after perforation

Summary

An elderly patient presented with extensive medical comorbidities, including diabetes, hypertension, diverticular disease, and liver cirrhosis with portal hypertension and ascites. The patient had previously developed necrotising fasciitis of the buttock. After initial debridement, the patient was transferred for further management and intensive care unit (ICU) admission. The patient then underwent a laparoscopic loop transverse colostomy and multiple debridement procedures to the buttock. Subsequently the patient was admitted for reversal of the loop colostomy. The patient was later readmitted for investigation of rectal bleeding. A colonoscopy was performed, which demonstrated what was thought to be a stenosis in the sigmoid colon. The colonoscope was pushed through the stenosis and into a large cavity, which was recognised as possibly being extra-colonic. The patient initially seemed well and further investigations were planned for the possible stricture and inflammatory mass.

Post-colonoscopy, the patient rapidly deteriorated with generalised peritonitis and sepsis. At laparotomy, there was a large perforation in the rectum and extensive adjacent diverticular disease. A limited Hartman's resection was performed and the patient was transferred for ICU admission and management. A re-laparotomy was undertaken and there was extensive intra-abdominal blood with active arterial bleeding from the pre-sacral area. This was controlled with suture, Floseal and packing. The patient was returned to theatre twice and eventually the packs were removed and the abdomen closed. A week after removal of the packs, the patient rapidly deteriorated.

A further return to theatre resulted in a diagnosis of purulent peritonitis. This was treated with abdominal lavage and rectal stump drainage. However, the patient continued to deteriorate and subsequently died.

Reviewer's comments

This patient had extensive comorbidities and, once faecal peritonitis from the perforated rectum was established, there was a high likelihood of mortality. It appears that the delay in performing the Hartman's resection may have contributed to the patient's demise. However, the perforation was secondary to the severe diverticular disease and it is possible that the stricture was in fact diverticulum - a recognised hazard of colonoscopy in the setting of severe diverticulosis.

Case 3: Upper gastro-intestinal (GI) haemorrhage 1 – recurrent GI bleed managed endoscopically

Summary

An elderly patient was admitted to hospital with recurrent gastrointestinal bleeding. A year earlier, the patient had been in the same hospital for melaena and had subsequently undergone a laparotomy, pyloroplasty and underrunning of a bleeding vessel. The patient had mild chronic renal impairment but no other major comorbidities. The patient was hypotensive but responded to resuscitation and was managed conservatively.

The patient underwent a gastroenterology review and gastroscopy. There was a large duodenal ulcer with a central clot and the area was injected with adrenalin and the clot removed. The visible vessel was treated with a gold probe. A stigmata was noted. The patient had a further re-bleed and another endoscopy was undertaken. A large ulcer was found with an acutely bleeding visible vessel, which was again treated with adrenalin and gold probe diathermy. Examination showed that the patient had a positive fluid balance over the next day with good volumes of urine output. The patient had an expiratory wheeze and tachypnoea, which suggested some degree of pulmonary oedema; this would not be unexpected in a patient of this age, with some underlying renal disease and having just been actively resuscitated following a significant gastro-intestinal bleed. A medical consultation was arranged to help manage the patient's medical problems.

The patient remained hypotensive and tachycardic with a subsequent spike in temperature. The patient then suffered a further bleed with a rise in pulse rate and at that point surgery was proposed.

At operation there were numerous adhesions from the previous surgery. A pyloroplasty, underrunning of an active bleeding vessel and a truncal vagotomy were performed. The operation was described as technically difficult. The patient was transferred to the intensive care unit postoperatively, but remained in a poor condition and underwent an arrest within the short time of the admission. The patient then died.

Reviewer's comments

There are two potential lessons from this case. When the second episode of bleeding occurred, surgical intervention may have been preferable, rather than a repeat endoscopy, as the presence of stigmata (noted at the first endoscopy) meant this patient had high risk of a re-bleed. Early surgery may have resulted in a different outcome.

It also appears that no one specialist or team had overall responsibility for the patient's care, with a frequent handover of patient care. The non-operative intervention was persisted with for too long.

Case 4: Upper GI haemorrhage II – surgery rather than endoscopy was required

Summary

An elderly patient was urgently transferred to a tertiary referral hospital with a history of sudden collapse and epigastric pain. The patient had a history of reduction in haemoglobin levels over a matter of months. One unit of packed cells was commenced. A presumed diagnosis of a possible leaking abdominal aortic aneurysm was made.

During transfer to a tertiary hospital, the patient was haemodynamically stable and no further blood transfusion was given. Review by the overnight surgical registrar revealed a history of several episodes of melaena. Vital signs, abdominal examination and PR were all normal, with no blood, melaena or masses noted. Admission blood tests showed below average levels of haemoglobin, high levels of creatinine and elevated troponin levels, but no electrocardiogram changes to suggest ischaemia or infarction.

A couple of hours later, the same surgical registrar witnessed the passage of moderate levels of melaena, but no fresh blood or clots. The patient was assessed as having had a large upper gastrointestinal tract (GIT) bleed, but was haemodynamically stable. The patient was now noted to have a NSTEMI secondary to hypotension and decreased haemoglobin. The registrar suggested the patient was not for surgical admission and was to be referred to the on-call gastroenterology team, given an intravenous infusion of esomeprazole and was not to be given any anticoagulant medication for the NSTEMI, in view of the risk of bleeding.

The following day, the patient underwent a gastroscopy by the gastroenterology registrar where an 'ulcer of the second part of the duodenum was noted with high risk features'. A large D2 ulcer with a visible vessel was injected with adrenaline and gold probed successfully with the proposal to re-scope if there was further bleeding.

Post-endoscopy, the patient was transferred to a general ward. Later that day, the patient became hypotensive. ICU indicated that they would not accept the patient, but that a high dependency unit (HDU) bed may be available. Due to a combination of factors, laparotomy was excluded as part of the patient's care.

A further endoscopy was undertaken but was unsuccessful and the patient subsequently died.

Reviewer's comments

This case highlights the importance of having a multidisciplinary haematemesis and melaena team (gastroenterologist and surgeon) in a tertiary referral hospital setting. The transfer of the patient to a general ward, and not an HDU, after the first endoscopy had shown a bleeding ulcer with high-risk features, clearly shows a lack of adequate system protocols, which would be present if such a team existed. Whilst many cases of upper GIT bleeding are successfully controlled endoscopically, this case clearly illustrates the importance of a multi-disciplinary team approach and the need for protocols for managing upper GIT bleeding.

Case 5: Massive haemorrhage and coagulopathy after elective procedure

Summary

This middle-aged patient had an elective laparoscopic cholecystectomy in a regional hospital for symptomatic cholelithiasis. The patient had previously been on Warfarin for atrial fibrillation. The operation itself was uneventful.

The patient received Warfarin on the day of, and following, surgery. A high dosage of Clexane was also given. Post-operation, the patient suffered significant internal bleeding into the peritoneum, diagnosed at subsequent laparotomy. The patient remained unstable, hypotensive, anuric, acidotic and coagulopathic in spite of treatment and was transferred to a tertiary hospital.

A repeat laparotomy was performed several days later and resulted in a diagnosis of repeat haemorrhaging with the patient in a moribund condition. The patient died shortly after.

Reviewer's comments

The combination of Warfarin and high dose Clexane was responsible for the initial bleeding. Severe ongoing coagulopathy and its failure to respond to treatment both by medical and surgical intervention were unpredictable in this situation. The timing and quantity of anticoagulant medications used after the elective procedure need to be considered.

Case 6: PEG is a risky procedure in patients receiving peritoneal dialysis

Summary

An elderly patient with weight loss and general inanition was admitted electively for percutaneous endoscopic gastrostomy (PEG). The history included chronic renal failure on peritoneal dialysis, asbestosis and restricted cardiomyopathy. The PEG was performed by a locum surgeon at a regional hospital without obvious incident. Post-PEG, the patient deteriorated rapidly with pain and development of peritonitis. The patient developed septic shock. The patient was treated for sepsis and hypotension and subsequently transferred to a major metropolitan hospital.

A laparotomy revealed ischemic necrosis of the gastric wall at the site of the gastrostomy with bilious peritonitis. A washout and oversewing of the gastric wall was performed and a repeat gastrostomy created using a Foley catheter. The surgery was performed by a surgical trainee with the consultant not in the operating theatre. Postoperatively the patient was managed in the intensive care unit with ventilation, inotropic support and antibiotics. Chest effusions required drainage. The patient failed to improve and nearly a week after a difficult weaning from ventilation it was decided to offer palliative care only. The patient died from respiratory failure.

Reviewer's comments

This case illustrates the danger of PEG, considered by some to be a safe and routine procedure. The patient developed septic shock within hours of surgery, and therefore ischemia and perforation are likely to be excluded. Complications related to PEG such as the flange being pulled too tight to the abdominal wall would be likely to develop over a number of days, not hours. It appears this patient developed peritonitis as a complication of PEG placement whilst on peritoneal dialysis – such complications are well recorded in the literature (Fian et al in *ADV peritoneal dialysis* 2007: 17; 1498-152). This underlying medical condition was such that the patient was never going to recover from peritonitis even with the best available management.

In summary, the decision to proceed with a PEG in a patient being treated with peritoneal dialysis may be an adverse event and the decision to proceed with PEG in a patient on dialysis should include the treating renal physician.

Case 7: Mesenteric ischaemic complicated endovascular procedure

Summary

An elderly patient with an abdominal aortic aneurysm (AAA) associated with a left renal artery occlusion had an endovascular procedure. A four-vessel fenestrated stent graft was performed, seemingly uneventfully, until the completion angiogram revealed no flow in the coeliac and superior mesenteric arteries. As this would lead to extensive gut infarction and could not be corrected using endovascular methods, a laparotomy was performed. This revealed ischaemic small bowel, liver and gall bladder - and a retroperitoneal haematoma due to rupture of the left iliac artery. Operative treatment continued to repair the diagnosed conditions but the patient became haemodynamically unstable due to a combination of haemorrhage and metabolic acidosis, and died.

Reviewer's comments

Elective intervention for AAA would be indicated in the absence of major comorbidities. The left renal artery occlusion increased the risk of renal failure but was not in itself a major contraindication to surgery. Where patients are fit enough for open repair, this may be a simpler and safer option.

Four-vessel fenestrated stent graft insertion is a technically challenging procedure. It should only be undertaken by endovascular surgeons with appropriate expertise and experience, and when the patient's aneurysmal anatomy and comorbidities dictate that a simpler stent graft or an open repair are not appropriate.

Case 8: The importance of medical staff communication both between teams and with patient

Summary

An elderly patient being treated for a lumbar fracture with NSAIDS was admitted following haematemesis and melaena. The patient was found to have suffered an NSTEMI. The admission haemoglobin level was considerably low. An erect CXR showed no free gas. The patient was admitted under the acute medical unit for resuscitation and a gastroscopy; however, subsequently a not for resuscitation (NFR) order was executed by the patient and next of kin.

A consent form for the gastroscopy and laparotomy was obtained. A gastroscopy proceeded diagnosing a large duodenal ulcer with perforation. Surgical intervention followed where gastrojejunostomy was performed and a feeding jejunostomy left in place. The patient subsequently developed atrial fibrillation (AF), ST depression and a rise in troponin levels. It appears the patient continued to revert in and out of AF until the patient became compromised and requested no further intervention. The patient died shortly thereafter.

Reviewer's comments

This death was not unexpected and it was considered unlikely that this patient would survive. It is important for all patients facing multiple conditions or complications to be fully informed of the likely prospect of success. It is important also that patient notes record such discussions in detail and that medical staff take the time to ensure that a patient's desires for their treatment are exposed in the face of a pessimistic prognosis.

Case 9: Death after surgery for a post-infarct ventricular septal defect

Summary

An elderly patient who experienced back and chest pain suddenly collapsed. On admission, the patient was in shock with low oxygen saturation. Bedside echocardiography showed a large ventricular septal defect (VSD) with very poor right ventricular function. The patient was transferred to the operating theatre where the ventricular septal defect was patched via a ventriculotomy and one vein graft was placed to the lateral ventricular coronary artery. The patient was weaned from bypass with low cardiac output and persisting poor right ventricular function. Coronary angiography had been performed prior to transfer to theatre. The patient was admitted to intensive care post-surgery. Abdominal examination revealed a previously undetected abdominal mass.

The next day the right leg was found to be very poorly profused. The consultant vascular opinion obtained by telephone recommended heparinisation. The vascular senior registrar reviewed the patient in the late evening, when ischaemia of the right leg was found. The notes suggest there had been an attempt to insert an intra-aortic balloon pump during the original preoperative angiography. A CT scan had shown a large pelvic mass with compression of the right-sided pelvic vessels. The case was discussed with the consultant on call, who felt that a crossover graft would not be tolerated. Further discussion with family occurred and the decision was taken not to actively intervene. The patient died nearly two days after admission to ICU.

Reviewer's comments

An elderly patient presenting in cardiogenic shock with a post-infarct large VSD and poor right ventricular function presents a huge surgical challenge. Logistic Euro score analysis from the data gives a 93% surgical mortality. At this extreme range of Euro score, such scores are generally an underestimate. Without surgery, the mortality risk would be likely to be 100%, but the decision to proceed to surgery is debatable.

Case 10: Fulminant emphysematous pyelonephritis

Summary

An elderly patient was admitted with severe sepsis, coagulopathy and a recent fall. Imaging with CT scans confirmed a fracture of the cervical spine at the level of C2 and C5. An abdominal CT scan showed a grossly dilated left pelvicalyceal system with renal calculi. The findings were in keeping with emphysematous pyelonephritis. The patient was coagulopathic with a high INR level and was haemodynamically unstable with a tachycardia and hypotension. The decision was made to drain the left kidney with a percutaneous nephrostomy tube rather than proceed to an immediate nephrectomy. There was some delay in obtaining the nephrostomy tube through the interventional radiologist at the treating hospital. The patient was then admitted to the intensive care unit confused, hypotensive, with a systolic low blood pressure reading and severely septic.

A nephrostomy tube was placed using radiological guidance under general anaesthesia and a bloody aspirate was obtained. This subsequently grew E. coli and was treated with the appropriate antibiotic.

Despite maximum intensive care support and the placement of the nephrostomy tube, the patient failed to improve with ongoing sepsis, worsening renal function and acidosis, as well as respiratory failure. The urology team deemed the patient's condition too unstable to proceed with nephrectomy and palliative treatment was instituted. The patient subsequently died.

Reviewer's comments

Emphysematous pyelonephritis is a severe infection of the kidney often associated with stone formation and obstruction. It carries a high mortality rate and the ideal treatment modality is either immediate nephrectomy if the patient is stable enough, or percutaneous nephrostomy tube to stabilise the patient. There have been reports of patients improving significantly with percutaneous nephrostomy and a delayed nephrectomy is then carried out.

Given the severe sepsis, it is questionable whether the patient would have survived a major operation like a nephrectomy in the setting of an infected and obstructed kidney. Although the patient did receive a general anaesthetic for the nephrostomy tube, this is a quick procedure with minimal risks for significant complications.

It is unfortunate that there was some delay in obtaining the nephrostomy tube, although an earlier nephrostomy tube may not have changed the eventual outcome**.**

Case 11: Poor immediate postoperative communication in a bleeding patient

Summary

An elderly patient was admitted for a rigid cystoscopy and resection of a bladder tumour. There was a medical history of hypertension and an AAA repair. The procedure trans-urethral resection of the bladder tumour was performed.

Postoperatively on the ward the patient had active bleeding. Continuous bladder irrigation was performed and traction applied to the indwelling catheter. The urologist was not informed of the active bleeding, but did, however, notice the active haematuria and that the blood pressure and haemoglobin levels had been low.

The patient was taken to theatre for evacuation of blood clots and control of the bleeding. A blood transfusion was required. A cardiac arrest occurred shortly post-surgery and the patient was intubated, resuscitated and transferred to intensive care. An emergency echo confirmed the presence of anterior wall and apical left ventricular hypokinesia. The patient received several units of blood and other blood products. Inotropic drugs were required to maintain the blood pressure. Over the next period the patient deteriorated and required increasing inotropics. A second cardiac echo showed akinesia of the anterior wall and a left ventricular function of less than 20%. The patient progressed to palliative care and died soon thereafter.

Reviewer's comments

The case adhered to reasonable and routine well-established clinical pathways for an elective endoscopic resection of a bladder tumour that was complicated by active haemorrhage. No communication occurred between the ward staff and the surgeon regarding the clinical deterioration of the patient in the immediate postoperative period, in regard to the clinical management of the post-active bleeding.

It is unclear as to whether the urologist reviewed the patient in recovery or on the ward during the postoperative period. There was thus no opportunity to discuss with the nursing staff the intraoperative findings and instructions about the plan of management post-operation.

The lack of communication between the surgical ward staff and the surgeon is an area of concern. With continuous active bleeding and low systolic blood pressure, it is open to suggest that the surgeon should be called. The active bleeding led to hypovolemia, which contributed to the onset of acute myocardial infarction in an elderly patient with vascular disease, resulting in multi-system failure and the death of the patient.

Case 12: Bleeding complicates treatment of a renal stone

Summary

An elderly patient presented with an incidental finding of an asymptomatic right renal stone. The patient had previously received extracorporeal shock wave lithotripsy (ESWL) for a stone between 5 mm and 10 mm in the lower pole of the right kidney. The medical background included ischemic heart disease, five-vessel coronary artery bypass graft and a mitral valve repair several years earlier, and subsequently atrial fibrillation with a pacemaker insertion. Other comorbidities included gout, gastroesophageal reflux, non-insulin dependent diabetes mellitus and hypercholesterolaemia. The multiple medications included Warfarin of several milligrams per day.

The patient was booked for ESWL, but the procedure was cancelled because of an elevated INR (this was performed several days later). The patient presented shortly thereafter with haematuria and right loin pain. A CT scan confirmed a large renal hematoma. Conservative resuscitation measures failed and the patient underwent a laparotomy and right nephrectomy shortly thereafter. The postoperative course in ICU was satisfactory except for a prolonged ileus. The patient was transferred to the surgical ward and over the next week the recovery was slow. The patient started to deteriorate with the development of renal failure, shortness of breath and heart failure. The patients succumbed to cardiac disease soon afterwards.

Reviewer's comments

The patient with gross haematuria and haemodynamically unstable, post-blunt renal trauma (ESWL) not responding to fluid restoration and blood product, should be managed by surgical intervention - most patients will end up losing their kidney. Patients with renal stones have a 70% chance of becoming symptomatic in the next five years if not treated. However, this does not mean that every patient with renal stones should be subjected to treatment or surgical intervention. In this case, a patient with a high risk of cardiac disease, on anticoagulation and completely asymptomatic should perhaps have been considered for observation and surgical intervention only upon the presentation of symptoms.

Although ESWL is considered a minimally invasive surgical intervention, like any surgical procedure it carries some risks which include a 0.1% chance of active bleeding that cannot be controlled by conservative treatment.

Areas of Concern

Although the risk of a thromboembolic event in this patient was high, there are risks to keeping patients on anticoagulation just before surgical intervention and immediate re-initiation of these drugs post-operation. Restarting the patient on Clexane postoperatively could have contributed to the bleeding and the development of a large renal hematoma. Heparin should possibly have been considered rather than Clexane as an anticoagulant because its effect can be easily reversed.

Case 13: The importance of DVT prophylaxis post-hip surgery

Summary

An elderly patient was admitted with an intertrochanteric neck of femur fracture. The patient had a background which included ischaemic heart disease with possible infarct a week earlier, cardiomegaly, diabetes and retention. The patient was assessed as high risk anaesthetic ASA Class IV (E) and underwent full medical assessment preoperatively. A reduction and internal fixation, dynamic hip screw under a spinal anaesthetic was undertaken the day after admission by a consultant surgeon. The patient was found unresponsive shortly after surgery. In view of the medical background and an NFR order, no further measures were taken and the patient died several hours later.

Reviewer's comments

The patient management was exemplary. However, it is notable that, while it had no bearing on the outcome, the consideration of DVT prophylaxis was missed - this should be a normal process. This may have an effect on another case and should raise the awareness of the need to order DVT prophylaxis in all cases.

Case 14: A rural hospital not prepared for a common emergency

Summary

A middle-aged patient developed a headache and then collapsed. The patient arrived at a rural hospital shortly afterwards and was triaged as a '2' priority. The motor response was not recorded, pupils were dilated, reacting, eye opening 1, speech 1 on GCS, temperature 35.1 and pO_2 saturation 96%. The secondary hospital emergency department advised that the patient should be transferred unintubated.

During the ambulance transfer the oxygen saturation was normal. Airway intervention was resisted despite the patient being unconscious with fixed dilated pupils. The patient arrived at the second hospital several hours after the initial presentation, breathing spontaneously, with Glasgow Coma Scale level 3. A chest x-ray demonstrated aspiration. Severe hypertension was treated with hydralazine that resulted in hypotension. The CT scan demonstrated a massive subarachnoid haemorrhage from a giant basilar aneurysm, with hydrocephalus and evidence of posterior cerebral artery infarction. Mannitol was started soon after arrival in the second hospital. The intracranial pressure was greater than 50 with the insertion of an external ventricular drain. Sedation was ceased and the patient remained unresponsive with unreactive pupils. The patient was palliated and brain death was certified the next day.

Reviewer's comments

In an ideal situation a patient presenting as above should have been intubated, ventilated and sedated prior to transfer. This would have prevented aspiration (if it had not already occurred), helped to maintain pO_2 levels and possibly helped to control intracranial pressure by preventing the pCO_2 from rising. The drugs used for this would need to be administered by someone experienced in airway management.

Mannitol 20% could have been administered at the rural facility with an initial dose of 100-200 ml IV. The logistics of communication between rural and major hospitals should be a priority of hospital managements. Advice between hospitals about such management should occur, as most of these treatments can be implemented in the rural setting, if staff members have the skills. This case suggests a need for staff training in the rural setting to be reviewed.

Case 15: Delayed surgery for a strangulated hernia

Summary

An elderly patient experienced excruciating pain in the left groin. The general practitioner referred the patient to an emergency department where a pelvic x-ray was reported as normal. The pain improved with Panadeine Forte and the patient was discharged. Several days later the patient was admitted with continuing colicky lower abdominal pain and 'feculent vomiting'. Medical comorbidities included AF, hypertension, hypercholesterolaemia and gastroesophageal reflux. Medications included atenolol, telmisartan, simvastatin and aspirin.

On examination, the abdomen was soft with slight epigastric tenderness. Bilateral reducible inguinal hernias were recorded. A plain abdominal x-ray showed multiple fluid levels, but no dilated small bowel loops. Intravenous fluids were given and a nasogastric tube (NGT) subsequently inserted. Unfractionated heparin and thrombo-embolic deterrent stockings were implemented.

On examination the consultant surgeon noted lower abdominal tenderness. A significant amount of liquid had drained nasogastrically in the preceding period with no flatus and a CT scan reported 'a right femoral hernia associated with a small bowel obstruction and a large left ovarian cyst'. Surgery was organised for a routine list several days later. The patient had been without nutrition for a week for a situation that would be uncorrected for at least another two days. That evening the patient developed atrial fibrillation which was managed by the cardiology team.

A gynaecologic opinion suggested an oophorectomy. The patient became hypotensive and bradycardic, probably secondarily to a sick sinus syndrome from the metoprolol prescribed for the AF. A laparotomy revealed small bowel herniating through a pudendal hernia. A resection of small bowel with a stapled anastomosis was needed

Several postoperative days later, coffee grounds were aspirated from the NGT. Gastroscopy demonstrated ulcerative oesophagitis. Heparin and aspirin were withheld. As the patient now had AF, an amiodarone infusion started. Aspirin and Heparin were recommenced. A faecal fistula developed in the abdominal wound with no local or systemic sepsis. Nearly two weeks postoperatively, the patient was readmitted to the ICU and became distressed, hypotensive and tachypnoeic due to complete heart block. Intubation was implemented and inotropes were given. Treatment was subsequently withdrawn, and the patient died.

Reviewer's comments

The delay of nearly a week to perform a laparotomy was a possible reason this patient died. Obvious symptoms had been present at admission. From the onset of symptoms to surgery, the patient developed cardiovascular complications and nutritional depletion that contributed to the patient's demise. The possibility

that the bowel obstruction was due to a hernia was excluded on the basis that the detectable hernias were non-tender and reducible. These hernias should not have distracted the patient's carers from diagnosing the cause of the obstruction that should have been diagnosed by an earlier CT scan. The operation was further delayed to coincide with an elective operating list. The formation of a fistula added to this patient's morbidity.