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Western Australian Audit of Surgical Mortality
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**Case Note Reviews
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Australasian and New Zealand Audit of Surgical Mortality

Royal Australasian College of Surgeons

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Case 1: Delay in managing small bowel obstruction following orthopaedic surgery I

Summary

A very elderly patient, with a significant history of chronic obstructive arterial disease, hypertension, peripheral vascular disease and hypothyroidism, as well as a previous open cholecystectomy, appendectomy and hysterectomy, presented with a fractured neck of femur following a fall at home. The patient was managed with an intramedullary nail the next day. The surgery appears to have been uncomplicated.

The patient developed nausea and vomiting on day three postoperatively. Abdominal x-ray revealed multiple distended small and large bowel loops consistent with an ileus, which was managed with intravenous (IV) fluids and nasogastric decompression. Over the next two weeks the postoperative course was mixed, with occasional bowel motions but ongoing abdominal distension and vomiting. The general surgical team was asked to review the patient nine days after the orthopaedic surgery. The initial assessment appeared to be of a tender rigid abdomen suggesting peritonitis, but much of the pain resolved following catheter insertion and it was felt that the findings were related to urinary retention.

Nearly two weeks postoperatively, increasing right iliac fossa pain was noted. Paroxysmal atrial fibrillation was also a problem. The patient remained afebrile but further abdominal x-rays revealed distended small bowel loops. It appears that no further investigations were undertaken until a surgical registrar review three days later. A computed tomography (CT) scan on the abdomen/pelvis revealed distended proximal small bowel loops with collapsed terminal ileum. Moderate pelvic fluid as well as a few locules of free gas was reported. The patient proceeded to surgery.

At laparotomy, multiple ileal adhesions with a segment of perforated ischaemic terminal ileum and caecum were noted. This was resected but intra-operatively more small bowel appeared dusky and an additional length was resected and an end ileostomy formed. Histopathology revealed ischaemic necrosis of the terminal ileum and caecum without evidence of mesenteric thrombus.

The patient remained ventilated in the intensive care unit (ICU) for the next two days but on extubation promptly developed respiratory failure and bilateral pneumonia present on chest x-ray. On discussion with the family, a decision was made that the patient would not undergo re-intubation or further invasive treatment and the patient passed away shortly thereafter.

Comment

The predicted mortality for a very elderly patient with a fractured neck of femur is high. It appears that the patient developed an adhesional small bowel obstruction in the first few days following orthopaedic surgery. Radiology and the clinical assessment initially pointed to ileus, but the presence of previous abdominal surgery and the protracted course should have suggested mechanical obstruction earlier than the diagnosis was made.

It appears there was some delay between development of persistent right-sided abdominal pain and further investigation. A CT of the abdomen should be ordered in cases of ileus persisting beyond a few days, and certainly with the development of persisting abdominal pain and tenderness. It is impossible to say whether earlier diagnosis and laparotomy may have altered the outcome, as clearly the predicted mortality for a patient of this age with other comorbidities and recent fracture is high.

It is likely that the patient developed ischaemic perforated gut, probably related to the obstruction. While the mode of death was respiratory failure, deconditioning due to long hospital admission and sepsis may have contributed.

Case 2: Delay in managing small bowel obstruction following orthopaedic surgery II

Summary

An elderly patient was admitted with confusion and left hip pain following a fall. X-ray reported an undisplaced acetabular fracture and it was decided to treat this conservatively. The past history included an ultra-low anterior resection ten years previously for a B2 Dukes adenocarcinoma. Chest physiotherapy was started with antibiotics. It was noted that the abdomen was slightly distended; a diagnosis of constipation was made and coloxyl, senna and glycerine suppositories were given.

Following admission it was noted that the abdomen was soft and non-tender and there was no abdominal pain. The nursing staff recorded there had been no bowel action, though the patient had vomited. The patient continued to vomit for another two days before a review by another on-call medical doctor, who noted the abdominal pain and distension of the abdomen. Intravenous fluids were started and an abdominal x-ray reported distended loops of the small bowel associated with multiple air-fluid levels.

Nearly a week after admission a review by the general surgeons was requested. The patient did not have abdominal pain and the abdomen appeared distended but not tender. A nasogastric (NG) tube was inserted; as the oxygen saturation decreased a chest x-ray reported right basal consolidation and Tazocim and Metronidazole commenced. The patient was prescribed an enema by the geriatricians and had a bowel movement.

The general surgical team noted the patient's bowels had opened but that the NG tube had been pulled out. Clear fluids were started over the following 48 hours, but the patient continued to vomit and had some diarrhoea. The NG tube was reinserted. On the ninth day the surgical team organised a repeat abdominal x-ray that showed ongoing small bowel obstruction. It was documented in the notes that the patient did not wish to have further surgery at that time.

Over the ensuing 48 hours there were high aspirates from the NG tube and the patient remained pyrexial. Eleven days after admission a CT scan showed ongoing small bowel obstruction and the following day a laparotomy was discussed with the family. At laparotomy on day twelve, an ischaemic area of small bowel with a perforation was found adherent to the rectal anastomosis. The ischaemic small bowel was resected and a washout performed. The patient was then admitted to intensive care. A further CT scan five days post-surgery showed no evidence of a leak or collection, but the patient's respiratory function deteriorated and death occurred.

Comment

There was undoubtedly a delay seeking a surgical opinion. There appears to have also been a delay by the surgeon in performing the surgery, although the patient's initial decision to decline any surgery would not have been helpful. This patient's underlying respiratory comorbidity was always going to be a problem but the undoubted aspiration pneumonia made survival even less likely.

Case 3: Communication failures and inaction in another case of missed small bowel obstruction ...

Summary

An elderly independent patient was admitted with increasing agitation/confusion, offensive smelling urine and lower abdominal pain following a laminectomy complicated by a urinary tract infection. The patient had an abdomino-perineal resection ten years previously.

On admission the patient was afebrile, tachycardic and normotensive. Abdominal examination revealed lower abdominal tenderness (no rigidity or guarding). Urine analysis showed leucocytes and blood. The full blood count was essentially normal. The patient was admitted under the care of the emergency department (ED) physician with a diagnosis of urosepsis. Urine micro culture and sensitivity (MC&S), blood cultures and other investigations were requested, and IV gentamicin and amoxicillin commenced. The next day the patient was still confused and now febrile.

A nursing entry noted 'stoma is not active'. The patient was reviewed by the on-call medical team who noted lower abdominal tenderness, concurred with the diagnosis of urosepsis and accepted the patient to the medical unit. The following day the patient was still complaining of abdominal pain and had tenderness to light and deep palpation. The colostomy bag was still empty. An urgent abdominal CT scan was requested.

The CT scan was performed the following day and showed a distal small bowel obstruction. A NG tube was inserted and a surgical review requested. That evening the patient was reviewed by the on-call surgical registrar (A), who noted 'nausea, vomiting', the 'stoma stopped working', the patient 'looks fine', 'afebrile' and that the NG tube had drained two litres of fluid. The registrar also detailed 'lower abdominal tenderness', the presence of 'bowel sounds' and a C reactive protein (CRP) of 370 but a normal white blood cell count. The registrar documented discussion of the abdominal CT scan with the radiologist and noted 'bowel obstruction with a huge stomach and duodenum', 'gas in the lower small bowel wall' and 'gas in the left iliac fossa'.

The registrar documented the discussion with the on-call general surgical consultant (A), who felt that there was possible bowel perforation and infection, and that the patient would benefit from conservative therapy overnight.

A generally tender abdomen was noted the next day and at laparotomy there were extensive small bowel adhesions in the pelvis from previous radiotherapy and two feet of intact gangrenous mid small bowel. The 'distal half of the small bowel was matted and fixed in the true pelvis' and 'freed with blunt finger dissection'. The gangrenous small bowel was resected and a side-to-side stapled anastomosis performed, some serosal tears repaired and an appendicectomy performed. This was done by surgical registrar B taking three and half hours.

Postoperatively the patient was managed in ICU, but failed to progress. The patient had a second emergency laparotomy by the same surgical registrar B, assisted by general surgical consultant B. There was a small bowel anastomotic leak. The anastomosis was taken down, a proximal jejunostomy formed with an end mucus fistula, as well as a gastrostomy and feeding jejunostomy. Postoperatively the patient experienced considerable problems with malabsorption. A variety of feeding methods were employed including jejunostomy feeds, total parenteral nutrition (TPN), gastrostomy feeds, and re-feeding jejunal effluent through ileostomy. The patient eventually demised two months post-admission.

Comment

There are a number of matters that are of concern in this case. There was a clear delay in diagnosis. While in hospital, the patient complained of abdominal pain for four days prior to the first operation, and the stoma bag was not active for this period, and yet no plain abdominal x-ray (AXR) or surgical review was sought by the medical team until day four of admission. There was a delay in getting a CT scan by the radiology department (>24hours) in a patient with peritonitis.

The first surgical review of the patient was by general surgical registrar A. The subsequent discussions between registrar A and on-call general surgical consultant A are of concern. There was a failure to appreciate that the patient had a high-grade bowel obstruction with focal peritonism, this in turn being suggestive of ischaemic gut. Clinically, the stoma had not worked and the NG tube had drained two litres of fluid in under six hours. There is no mention of whether the fluid was bile-stained or faeculent. The documented 'lower abdominal tenderness' and presence of 'bowel sounds' suggests inexperience with no

mention of percussion or rebound tenderness and guarding. Moreover, the knowledge of a raised serum CRP of 370 and a radiologist's verbal report of the abdominal CT scan showing a 'bowel obstruction with a huge stomach and duodenum', 'gas in the lower small bowel wall' and 'gas in the left iliac fossa', should have raised alarm bells. The decision to manage this patient conservatively overnight was an error of clinical judgment.

Supervision was an issue, as was seniority of the operating surgeon. There are doubts as to whether it was appropriate for the surgical registrar B to perform surgery of this magnitude without a consultant. The length of the procedure (3.5 hours), the numerous (4 - 5) serosal tears, the use of 'blunt finger dissection' to take down 'matted and fixed' post-radiotherapy small bowel pelvic adhesions, and the performance of an appendicectomy when the pathology was in the pelvis and the left iliac fossa all suggest inexperience. The subsequent small bowel anastomotic leak also supports this as small bowel anastomoses are usually very forgiving.

This case highlights a major systemic issue in the relationship between registrars and consultants in the acute surgical setting. It is now frequent practice for consultants to be on call with registrars of whom they have little knowledge or experience of their clinical and operative skills. In this case there were two registrars and two consultants involved in the management of a patient with an adhesive proximal small bowel obstruction with compromised small bowel. There was a delay in diagnosis (four days), a failure to act surgically when the evidence was clear that the patient had ischaemic/gangrenous small bowel, and the first operation was carried out by an inexperienced registrar without a consultant present. While it is easy to blame poor outcomes on inexperienced registrars, ultimately the responsibility must always lie with the supervising consultant surgeon. The onus is on consultants to make sure they know the competencies and limitations of the registrars they are on call with.

Case 4: Delay in diagnosis of pseudomembranous colitis

Summary

An elderly patient with severe hip osteoarthritis had a past history of hypertension, chronic renal failure, gout and emphysema. Biochemistry on admission showed an elevated creatinine (283) and hyperkalaemia (5.7). An uncomplicated total hip arthroplasty was performed. A stat dose of perioperative antibiotic was continued for four days. The PCA was ceased on the second day and substituted with oral narcotic analgesia, principally oxycodone.

Three days later the patient developed a tachycardia, became confused and had a fall. Neurological observations were instigated and antibiotics recommenced when it was noted that the patient became febrile. The next day the patient was lethargic, confused and incontinent of faeces. A medical registrar noted abdominal distension. The creatinine had increased to 310. The clindamycin was ceased and MS Contin commenced. The next day the medical registrar noted a distended tympanic abdomen and peritoneal oedema. *Clostridium difficile* (*C. difficile*) had been cultured from the stool. The cephazoline was ceased and a working diagnosis of 'toxic mega colon' made. Vancomycin orally was commenced that evening and a surgical review recommended. The surgical registrar suggested a CT scan if there was any deterioration.

Early the next day the medical registrar again noted hypotension, *C. difficile* and acute on chronic renal failure. The patient was transferred to the high dependency unit (HDU) and at some time later to ICU. A CT scan about midday showed thickening of the colon consistent with pseudomembranous colitis. Various lines were inserted, in the course of which the patient arrested and could not be resuscitated. An autopsy was not performed but the probable cause of death was *C. difficile*.

Comment

This death was not primarily caused by the surgery. The patient exhibited a number of risk factors for *C. difficile* and toxic megacolon: age over 65, hospitalisation, multiple antibiotics and narcotic administration. The first symptoms of infection were present when the patient had diarrhoea and abdominal distension. In spite of *C. difficile* being cultured, the diagnosis was considered but not made and appropriate treatment not instituted. The CT scan confirmed the diagnosis but was undertaken too late to alter the outcome. It is unlikely the minor head injury was significant. It is also unlikely that the procedure being undertaken at the time of arrest was causative of it.

It is worthy of note that over the five days prior to admission to ICU the patient was assessed by over 10 doctors, many on only one or two occasions. It is unfortunate that continuity of care cannot be provided in these settings.

Case 5: Inadequate management of postoperative haemorrhage

Summary

An elderly patient underwent a major abdominal operation for what was ultimately proven to be a T1N1M0 abdominal cancer. The operation was uneventful, as was progress over the first six days.

The patient then had a haematemesis and melaena (Hb 66) during the night. The consultant was advised by the resident medical officer (RMO) that the patient was stable and resuscitation commenced in the early hours of the morning. By 08:00, when reviewed by the consultant, the patient had had four units of blood and three units of fresh frozen plasma, and was in florid pulmonary oedema and had to be admitted to ICU. A CT angiogram was ordered as the abdominal drains were showing blood, but no bleeding point was seen. As the haemoglobin fell again the patient was taken to theatre. The bleeding point was easily found and secured. The patient went to ICU but developed DIC; the patient failed to respond to blood products and died.

Comment

The consultant commented that the surgical team would have directed the resuscitation themselves and that the patient should have been returned to theatre without an angiogram as it was obvious the patient was bleeding. The consultant was of the view that earlier, supervised resuscitation and survey may have resulted in a different outcome.

This case highlights the problem of availability of senior surgical staff at night, when unexpected, serious or life-threatening postoperative complications develop in the ward. The risk of postoperative haemorrhage is significant in this extensive procedure.

In this case initial assessment by the on-call medical practitioner was important. Anticoagulation therapy should have been ceased with the first episode of haematemesis. From the notes it is difficult to estimate the delay time period between the first haematemesis and return to theatre, but it was approximately 20 hours. Taking into account the need for emergency resuscitation and the relevant assessment and investigations, the delay probably contributed to the final outcome.

The availability of senior surgical staff at night is critical. A protocol involving more senior staff may have resulted in a different outcome.

Case 6: Under-appreciated comorbidities contribute to death from gangrenous cholecystitis

Summary

An elderly patient presented to a regional hospital emergency department with an acute abdomen. The past history included type II diabetes, hypertension, ischaemic heart disease, congestive cardiac failure, diverticular disease, gout and a hiatus hernia. Medications included prednisolone. A CT scan on the day of initial presentation identified diverticular disease but no other significant abnormality.

The patient was discharged with oral antibiotics only to re-present with increasing pain the following day. After surgical review an urgent laparotomy was undertaken. The colon was not significantly inflamed. A normal appendix was removed. The gall bladder was identified as being acutely inflamed and was removed in retrograde fashion, with a drain left in the gall bladder bed.

Following this, the patient deteriorated as evidenced by respiratory failure and oliguria within 12 hours of the surgery. A different surgeon reviewed the patient on each subsequent day with continuity provided by a house officer. On the second postoperative day the patient was clearly septic and had bile in the drain and was transferred to a tertiary hospital that evening. On the fourth postoperative day, a re-laparotomy was undertaken and bile seen to be issuing from the gall bladder bed. A cholangiogram was performed and this showed a stone in the distal common bile duct and this was dealt via the cystic duct stump. A T-tube was placed.

Following this the patient was cared for in either ICU or HDU. However, the patient succumbed on the ninth day after the second procedure when, presumably relating to ongoing intra-abdominal sepsis, an intraperitoneal haemorrhage developed, and the patient collapsed and did not respond to attempts at resuscitation.

Comments

The initial CT scan that guided the attending doctors to diagnose diverticulitis was reported by the radiologist as showing no obvious inflammation. The cholecystitis was not identified, nor the presence of gallstones reported. The liver function tests at presentation did not demonstrate clear-cut evidence of cholestasis; however, this progressed later and indeed the gall bladder at laparotomy was found to be obstructed by a stone in Hartmann's pouch and a retrograde procedure was performed.

Most surgeons would not proceed to an exploration of the common bile duct in this situation. In cases of presentation of such a patient with significant comorbidities and limited physiological reserve, an early transfer to a tertiary hospital may have been warranted prior to the initial laparotomy.

Case 7: Discontinuation of anti-platelet therapy may have contributed to immediate postoperative AMI following knee replacement surgery

Summary

An elderly patient with a prior history of a successful right knee replacement eight years previously was admitted to a large private hospital for elective left knee replacement surgery. The significant medical history included coronary stenting (several years prior to this episode) with a short admission three months before this operation for a transient ischaemic attack/cerebrovascular accident. The patient's usual medications included Asasantin, a statin, and an antihypertensive. The patient was instructed to cease the Asasantin one week before surgery. This decision had been purportedly reached after consultation with a General Physician and the treating Cardiologist although there is no documentation from the surgeon or either specialist regarding this fact.

The patient was admitted on the morning of surgery, and as per the surgeon's standard protocol, an electrocardiogram and lab tests were undertaken. The anaesthetist who made an annotation on the anaesthetic record reviewed the patient that both the physician and the cardiologist had cleared the patient for surgery. A routine tri-compartmental knee replacement was carried out under general anaesthetic with supplementary femoral nerve blockade. The operation was uneventful and the patient remained stable while in the recovery room and was transferred back to the orthopaedic ward. The ward nursing staff recorded several sets of normal observations and the patient appeared to be making an uneventful recovery. Clexane 20 mg and Asasantin were given late that evening.

Shortly after midnight, the patient was found unresponsive. The patient was found to be in ventricular fibrillation with carcinogenic shock and was incubated, ventilated and a period prolonged of resuscitation ensued. The patient was transferred to the ICU, and subsequently was found to have sustained a massive anterior acute myocardial infarction (AMI), with resultant hypoxic brain damage. The patient progressively deteriorated over the next 48 hours, and a decision was made to withdraw support. The patient died 72 hours after the surgical procedure.

Comment

Given the patient's vascular disease, any major surgery entailed significant risk.

However, there are two areas for consideration and perhaps concern. Firstly, the merit of undertaking an elective total knee replacement (TKR) just a few months after hospitalisation with a cerebrovascular event. There is no documentation within the hospital notes concerning the nature or severity of this cerebral event, nor of any investigations that might perhaps have reassured the surgeon and anaesthetist alike that elective TKR could proceed with acceptable risk. Secondly the temporary cessation of the Asasantin so soon after the recent cerebral event is surprising considering the circumstances.

A more cautious approach might have been to suggest delaying the TKR operation, or recommending the anti-platelet agent not be stopped. The important issue in this case was the decision to discontinue the anti-platelet therapy. The theoretical (but unproven) benefit of withholding antiplatelet medication prior to TKR must be balanced against the real (proven) benefits of maintaining anti-platelet medications peri-operatively in patients with coronary stents and carotid artery disease. The fact that the decision to temporarily withhold the Asasantin was in this case made in conjunction with other specialists does not change this fact.

Case 8: Poor peri-operative management in a critically ill patient with a perforated viscus

Summary

An elderly patient presented to the ED of a large metropolitan hospital in the late afternoon with a three-day history of anorexia, vomiting and (non-bloody) diarrhoea. On admission there was a low grade fever (37.5 °C) and severe dehydration, but vital signs were within normal parameters. Examination findings revealed tenderness in the left lower abdomen quadrant with 'firmness' on palpation, but no guarding. Blood tests showed a normal haemoglobin, mild leucocytosis with neutrophilia, raised CRP (260) and renal dysfunction. There was no free intraperitoneal gas on the chest x-ray, whereas the AXR was interpreted to show multiple air-fluid levels in dilated bowel loops.

Surgical review six hours later noted tachycardia and tachypnoeic with mildly decreased oxygen saturation. The General Surgery registrar again documented tenderness in the left lower quadrant of the abdomen with 'voluntary guarding' and 'sluggish' bowel sounds. Arterial blood gas analysis showed a metabolic acidosis. A plan was made for admission, intravenous fluid resuscitation and antibiotics, and an abdominal CT scan the following morning. During the night the patient was prescribed three litres of Normal saline IV and the resident medical officer administered a further 250 ml of Normal saline IV bolus due to poor urine output.

The CT scan reported a pneumoperitoneum and free peritoneal fluid with dilated small loops containing fluid levels and collapsed distal small bowel and colon, with no transitional point identified. A laparotomy found faecal peritonitis secondary to a stercoral perforation. A Hartmann's procedure was performed. The patient was returned to the ward postoperatively and received a further three litres of IV fluid.

Over the following postoperative days IV colloids (mostly Normal saline) with IV boluses of Frusemide were given in an attempt to maintain a satisfactory urinary output. The patient was in positive fluid balance by several litres per day. At the end of the third postoperative day the patient became tachypnoeic and dyspnoeic with bilateral crackles in lung bases to auscultation. A computed tomographic pulmonary angiography excluded a pulmonary embolus, but showed bilateral pleural effusions in keeping with heart failure.

On day four a review by a medical registrar noted lateral changes on ECG; although the ECG showed moderate to severe left ventricular dysfunction, and serial plasma creatine kinase (CK) was elevated but the Troponin was normal. The dyspnoea, tachypnoea, tachycardia and hypotension persisted and admission to ICU was arranged. Supportive measures were instituted to no avail. A decision was made not to escalate care and death followed later that day.

Comment

There were a number of issues that could, and probably should, have been handled better. It is of concern that the findings of haemodynamic instability, early peritonitis, raised inflammatory markers, renal impairment and metabolic acidosis did not lead the junior surgeon to commence more aggressive supportive care and seek senior advice from the outset. The recognition of the acutely ill surgical patient has received much attention in recent years, but is still a challenge as this case illustrates. There was sufficient evidence from the initial assessment and investigations to indicate that this elderly patient was critically ill.

The AXR performed two hours after presentation to ED was only reported two days later but showed 'a silver of air seen beneath the right hemidiaphragm. This is suspicious of free intra-peritoneal air and perforation'. The radiology department needs to review its reporting processes as it is inappropriate that an emergency X-ray is only reported after two days and that a material abnormality was not directly communicated to the surgical team.

This elderly, septic, American Society of Anesthesiologists (ASA) grade 4 patient with left bundle branch block and a poor exercise tolerance underwent an emergency laparotomy for a perforated viscus. It was not appropriate that the patient was returned to the ward. The patient should have been admitted to at least an HDU, arguably an ICU postoperatively. The postoperative fluid management of large quantities of Normal saline coupled with Frusemide was clearly suboptimal.

Case 9: Death after colonoscopy I - delayed laparotomy after colonoscopic perforation.

Summary

An elderly patient with unexplained abdominal pain was referred for upper gastrointestinal endoscopy and colonoscopy. This was performed by a surgeon endoscopist in the morning. The colonoscope could not be passed beyond the hepatic flexure and this was attributed to looping. Postoperatively the patient complained of severe abdominal pain and the surgeon ordered erect abdominal x-rays.

The x-ray report read: 'There is a huge pneumoperitoneum, indicating intestinal perforation'. The results of the x-ray were apparently conveyed to the surgeon the same evening as the surgeon wrote in the progress notes 'colonic perforation after colonoscopy'. Orders were given for nil by mouth, IV fluids and antibiotics, an indwelling catheter and to monitor urinary output.

Nursing notes in the evening and into the early morning recorded that the patient was in considerable pain, with a pulse rate of about 120 and a systolic blood pressure of less than 82 mm Hg. The patient was tachypnoeic and the oxygen saturations were low. There is a reference about the case being discussed with a doctor (perhaps the Accident and Emergency (A & E) resident) who ordered further IV fluids.

The patient remained hypotensive, tachycardic, tachypnoeic and oliguric. On the morning round the resident noted a paralytic ileus with the abdomen being very tender and distended. The consultant was notified of these changes later in the morning.

At laparotomy performed at lunchtime, some 24 hours after the colonoscopy, there was a full thickness perforation in the sigmoid colon. Bile stained fluid was found in the peritoneal cavity. The perforated segment of colon was resected as Hartmann's resection. The patient was transferred to a metropolitan teaching hospital for ICU care but died two days later.

Comment

There was clear evidence that this patient had a colonic perforation on the evening of the colonoscopy. The correct management was an immediate operation. It is not clear why the surgeon did not operate immediately. During the evening the patient started to display signs of shock, but the junior medical staff clearly did not recognise the implications of this and the surgeon does not appear to have been notified.

Septic peritonitis of 24 hours duration is associated with a massive mortality, especially in an elderly patient. Had a laparotomy been performed immediately after the x-ray was taken, the delay would have only been six hours. It is probable that the patient might have then survived.

Case 10: Death after colonoscopy II – failure to recognise deterioration after colonoscopic perforation

Summary

An elderly patient was admitted with bleeding per rectum. A colonoscopy found 'severe diverticulosis through the left colon'. At the hepatic flexure there was a bleeding (sessile) polyp on a difficult fold. A biopsy was taken and the polyp was removed using snare technique. The patient was classified as ASA grade 3.

The surgeon was concerned about the possibility of a perforation and the patient was placed on clear fluids. The patient had severe abdominal pain that night, but the surgeon was not called. The nursing notes contained the following comments: 'Pt. complained of abdominal pain. Analgesia was given'. Some forty minutes later the patient was 'grunting' in pain and had a small vomit. The observations were unremarkable, but the abdomen was tender to the touch and distended. The surgeon was not called.

The surgeon reviewed the patient on routine ward round the next day and appreciated the problem. At laparotomy there was a leak from the polypectomy site. There was gas in the mesentery and extending into the retroperitoneum. There was no actual faecal leak into the peritoneal cavity itself. A right hemicolectomy with a defunctioning ileostomy was performed. The patient's condition deteriorated after the operation and death occurred eight days later.

Comment

It is a matter of concern that the surgeon was not notified about the patient's deteriorating condition. The problems listed by the attending nursing staff suggest that there was sufficient evidence to call the surgeon. A painful distended abdomen is not normal after colonoscopy. The nursing staff failed to link these findings with the surgeon's written concerns about a perforation. The problem was not a failure to call the surgeon when the problem was recognised, but rather a failure of the nursing staff to appreciate that there was a problem.

Case 11: Respiratory arrest following total thyroidectomy

Summary

The patient was admitted for an elective total thyroidectomy for multinodular goitre. The preoperative checklist was completed prior to the initiation of anaesthesia. The surgery seemed to have been difficult with inflamed planes but was completed successfully and relatively uneventfully. There were no major areas of concern. The plan was for the patient to return to the HDU. Postoperative analgesia had been written and prescribed.

The operation note is in two forms. One is a handwritten note with no description of the operation and no postoperative orders or signatures at all. The second is a formal typed report with full description and postoperative orders. Written on the typed sheet is a note with the comment 'new sheet 2. Received at 16:15 hours'. The assessor assumed that this was received on the ward at this time.

The patient progressed as expected with completely routine observations until the administration of Panadeine Forte for 'soreness' which was followed by 10 ml IM morphine at '03:45'. Five minutes after the administration of the IM Morphine a medical emergency team (MET) call was activated as the patient had a respiratory arrest. Cardiopulmonary resuscitation (CPR) was commenced and an on-call anaesthetist intubated the patient at approximately 04:00. The patient was transferred to a teaching hospital ICU. A CT scan suggested massive hypoxic brain injury and treatment was withdrawn.

Comment

There appear to be no issues with the decision to operate, performance of the operation or decision to transfer the patient. The record keeping is adequate but there are areas of significant concern. It is unclear whether the typed operative note was available to the staff on the HDU although there is a written comment that the new sheet was received. If it was not, the postoperative instructions were very inadequate.

The analgesia written by the anaesthetist postoperatively was for Panadeine Forte and morphine at 10–15 ml. No other analgesic choices were available. While neither of these analgesics was prescribed in excessive dosage, the strict adherence to 10ml may have contributed to the arrest and it would be prudent to look at a means of titrating such doses up to a maximum over a period of time rather than administering a prescriptive 10–15 ml dosage.

The area of most concern is the administration of such a dose of opiate analgesia to a patient who appears to be in minimal pain and the rapidity of the respiratory arrest. The rapidity of the arrest (within 5 minutes) suggests a rapid absorption of the morphine and possible intravenous injection within the muscle rather than intramuscular. A review of the method of administration of such high doses would be beneficial to ensure measures are taken to avoid inadvertent intravascular administration.

It would be advisable for the opiate antidote Naloxone be present on each ward in an easily attainable area in a pre-made syringe. Similarly the assessor advised that the Benzodiazepine antidote Flumazenil should be prepared in case of an adverse effect from this sedative. Perhaps they could be included as a standard in the resuscitation trolley, in pre-made syringes. Although the MET call was initiated at an early stage there appears to be no indication that Naloxone was administered. Had this been given immediately, further adverse outcomes may have been reduced or avoided.

The discharge summary commented on the stridor occurring prior to the administration of the morphine, as did the transfer form from the regional hospital. This does not appear to be the case on examining the original case notes. The stridor seems to have occurred after the administration of the morphine rather than before. However, if this assumption is correct, then further education may be warranted as to the significance of stridor in an individual, especially after thyroid surgery.

Case 12: Septic shock undiagnosed for two days

Summary

An elderly patient was admitted to a peripheral hospital with a three-day history of abdominal pain, vomiting and diarrhoea. Past history included diabetes, rheumatoid arthritis, a recent colonoscopy which showed diverticular disease, and anaemia of unknown origin with recurrent transfusion. Drugs included anti-inflammatory and immunosuppressive medication.

The patient presented to an ED in the morning. The nursing triage notes indicate a hypothermic shock (systolic blood pressure 85): 'Pain ++ guarding. Abdomen very tender on palpation'. The patient was admitted to the ward under the physicians and the RMO wrote: 'Patient states faeces coming from vagina. BP 57/39'.

Despite the above history, a diagnosis of gastroenteritis was made and IV fluids were given, and the medical consultant was notified. This elderly patient was diabetic, immune compromised by drugs, had abdominal pain of uncertain origin and was in shock. A surgeon should have seen the patient. The next morning the patient was seen by the medical team and progress notes state: 'still having diffuse abdo pain - diffuse tenderness'. The patient was still hypotensive, hypovolaemic and tachycardic. There was still no request for a surgical opinion.

In the early afternoon of the same day, a medical ward round took place. The notes indicate the following: 'Patient complains of diffuse abdominal pain.... Generalised guarding of abdomen. Pain worse - left lower quadrant. Rebound tenderness. Impression ? Diverticulitis. Plan. Start IV antibiotics. Surgical review. Transfused 2 units packed cells'. The doctors were sitting on a case of peritonitis in a shocked patient who, despite past history, was being treated conservatively.

Two hours later a surgical review was requested. The surgical registrar diagnosed acute diverticulitis with dehydration and suggested further medical treatment.

In the early evening of the same day, some 30 hours after presentation, the patient was hypotensive (systolic BP 80), pale, hypothermic, 'tender, guarding/rigidity abdomen'. A CT scan showed perforated diverticulitis with free air fluid. The entry in the notes was: 'Plan. Discuss with medical consultant. If remain unstable, transfer to ... hospital'.

The next morning the patient was confused, shocked and febrile. Generalised peritonitis was recognised and urgent transfer undertaken. The patient subsequently had surgery, but died of complications of faecal peritonitis.

Comment

It is of concern that the obvious septic shock was not only missed at presentation, but also remained undiagnosed for 48 hours. It is of even greater concern that a CT scan showing pneumoperitoneum was not acted on. Under the best of circumstances perforated diverticulitis has a prohibitive mortality, but a delay such as this makes survival impossible. The hospital and staff should review this patient's care.

Case 13: Unreasonable delay secondary to inadequate theatre access

Summary

A very elderly patient was admitted to a tertiary trauma centre late at night with a fractured neck of femur. An orthogeriatric medical review occurred the following morning and the patient was deemed fit for surgery.

The patient fasted for theatre for three consecutive days but it was not until the fourth day that the appropriate surgery was undertaken. The patient died the following day.

Comment

The patient was assessed preoperatively as ASA grade 3. Each day of fasting was appropriately addressed with IV fluid hydration and oral intake once the ward staff were told the patient was not going to be operated on that day. This appeared to maintain adequate hydration, with the patient maintaining an acceptable urine output.

It is an unfortunate reality of modern public hospitals that elderly patients with neck of femur fractures are not seen as extremely urgent cases. They are routinely categorised as less urgent than open fractures, multi-trauma cases and neurovascular-compromised limbs, and many units only perform neck of femur surgery during office hours and into the early evening. At times, when the theatres get busy, it is not uncommon for elderly patients with neck of femur fractures to be 'bumped' on consecutive days. Unfortunately as pressure on our public hospital resources mounts, there may be more cases such as this one.

Case 14: Would a different operation have resulted in a different outcome?

Summary

An elderly, high risk (ASA grade 3) patient with a rectal cancer at 10 cm from the anal verge underwent surgery. Comorbidities included hypertension, non-insulin dependent diabetes, atrial fibrillation, pulmonary hypertension, severe left ventricular hypertrophy and chronic renal failure.

The operation did not proceed well – the sigmoid colon was initially resected, at open laparotomy, and on opening the specimen no cancer was found. Subsequent pelvic dissection was performed and the tumour was identified. Part of the rectum was removed and then stapled over. Unfortunately, due to severe bleeding from the pelvic side wall and apparently the ovarian vessels, the pelvis was packed and the patient was transferred to ICU.

The packs were removed the next day and the abdomen closed. The patient was managed in ICU for a further three days. During the postoperative period there were ongoing issues with worsening renal impairment, slowly developing sepsis and an altered conscious state. The patient was transferred back to ICU on the sixth postoperative day and died four days later. The cause of death was put down as acute renal failure and septicaemia.

Comment

This elderly woman represented a considerable risk for rectal cancer surgery and less invasive options such as local excision may have been considered in this scenario. As it is, the patient had a low Hartmann's procedure, an operation that is currently not favoured for the management of rectal cancer as it is associated with a high rate of pelvic abscess formation and complications. In fact, patients who are being considered for such an operation are probably better managed by having an abdominoperineal resection. There have been a number of views on this topic.

The development of severe intra-abdominal bleeding during this procedure is also a cause for concern. In the hands of an experienced colorectal surgeon this would be considered a rare event. The assessor formed the view that a combination of the patient's age, comorbidities and an inappropriate surgical procedure which did not go according to plan, all contributed to the poor outcome in this patient.

Case 15: Perforation of small bowel during laparoscopic surgery

Summary

An elderly patient with recurrent episodes of acute diverticulitis underwent a laparoscopic, high anterior resection. The anaesthetic and surgical notes suggest a routine intraoperative course. No comment was made regarding the presence of adhesions or whether an adhesiolysis was undertaken.

The patient progressed uneventfully for around 15 hours, at which point there was a sudden onset of a sharp abdominal pain. There was gradual worsening of the abdominal pain and an associated deterioration in the patient's vital signs. The dwindling urine output was appropriately flagged early by the nursing staff. No clear medical input was documented during this deterioration, although repeated fluid boluses were prescribed by phone.

Approximately 48 hours following the initial operation, an exploratory laparotomy was undertaken. The indication for this was not documented, but was inferred by the patient's septic physiology and worsening abdominal pain. A perforation in the terminal ileum was identified and resected, and the area exteriorised with a double barrel stoma. Bile was noted throughout the abdomen, and note was made of a four litre wash. The colonic anastomosis was noted to be intact.

The patient was admitted to the ICU postoperatively. The patient returned to theatre approximately 36 hours later for re-exploration secondary to worsening sepsis. At this time, a gangrenous descending colon and distal small bowel was diagnosed. A completion colectomy and distal small bowel resection, with end ileostomy formation was performed. The abdomen was left open. Despite ongoing intensive support, the remaining bowel also infarcted and a decision was made to withdraw treatment.

Comment

This patient had a serious adverse event. The small bowel injury identified at the exploratory laparotomy was likely sustained and unrecognised during the initial operation. This event triggered an unusually aggressive inflammatory cascade that resulted in death.

This case highlights the need for constant vigilance for the identification of a deteriorating patient. The abdominal pain and subsequent low urine output was acted on slowly, by junior medical officers, who probably did not consider possible serious postoperative differential diagnoses. The correct decision for a return to theatre was only made at the morning ward round. It unfortunately appears that the initial management of the patient's physiology was made by medical officers over the phone. It is speculative if a return to theatre 12 or so hours earlier would have changed the ultimate outcome, but perhaps an earlier operation may have short-circuited the inflammatory cascade and prevented it from spiralling out of control.

After the second operation, the assessor concluded that the patient may have developed an abdominal compartment syndrome and this, together with splanchnic vasoconstriction from high inotropic requirements, led to the infarction of the colon and distal small bowel. No underlying vascular disease was identified in the autopsy. Why the patient developed such an exaggerated inflammatory response is unknown. This could not have been predicted, or managed differently.

It may have been well advised to use a broader spectrum, bactericidal antibiotic, and also included an antifungal. In terms of the small bowel perforation, it is speculation that the possible cause was likely injury at the initial operation. Possible causes are an adhesiolysis, a trocar injury, a thermal injury from diathermy or the harmonic scalpel, a traction/mechanical trauma injury or an inadvertent inclusion of a bowel loop in a closing stitch. In any case, an unrecognised technical mistake occurred. The surgeon put a possible malfunction of the harmonic scalpel high on the list of possible causes. However, given the rapid development of clinical signs it is doubted a partial thickness thermal injury would be a cause— this may be expected to present later. It is probable that a full thickness injury to the bowel occurred.

The patient's anterior resection was performed with a laparoscopic technique. A review of the literature reveals a paucity of information but the incidence would appear to be in the order of 1:100. It seems that the accidental enterotomy rate may indeed be higher than what would be expected.

Case 16: Missed strangulated femoral hernia

Summary

An elderly patient presented with a new, irreducible mass in the groin. Unfortunately the patient was discharged home and re-presented back two days later in extremis. On this occasion the strangulated femoral hernia was correctly diagnosed and the management adequate and appropriate. Despite best efforts of the staff the patient, ultimately succumbed from multiple organ failures.

Comment

There are a few aspects of this patient's initial presentation to hospital which appear unsatisfactory and require attention.

The patient was possibly seen by an intern in the ED, having been referred by the general practitioner who was concerned about an 'obstructed inguinal hernia'. The surrounding inguinal region was noted to be tender and the large mass (5 x 3.5 cm) was also mildly tender. The nursing notes record that the patient felt 'awful', was nauseated and had vomited. Why was such a patient sent home? There is no documentation in the notes to confirm that a more senior ED registrar or consultant saw this patient.

An AXR was requested at the time. A review of the films clearly shows multiple distended loops of small bowel along with air-fluid levels, classical for small bowel obstruction. No comment was written in the ED notes about the doctor's impressions of the films.

There was a possible plan to refer to the surgical team; however, no further documentation was made regarding this. Was the surgical registrar contacted? Did the surgical registrar review the patient? An outpatient referral was made instead. It is extremely concerning that the initial ED doctor concluded that there was no clinical sign of obstruction. The AXR had 'nil sign of obstruction' and that the patient was in 'minimal pain'.

This sequence of events was preventable. The initial ED doctor clearly missed the diagnosis and the patient was sent home without senior input from the ED consultant. It is clear the abnormal AXR was not only missed by the ED doctor, but that the hospital radiology department did not ensure the result of this clearly abnormal AXR was communicated back to the doctor. This highlights the need for hospitals to ensure the adequacy of both the supervision of juniors in the ED and its radiology reporting processes.

The documentation in the notes was inadequate. A separate note should have been made regarding biochemistry and radiological findings, and a follow-up plan should have been added after the patient had been reviewed again.

Case 17: Missed subdural collection

Summary

A very elderly patient presented to the ED of a major tertiary hospital after being found on the floor of a room in a hostel. The patient had significant past comorbidities, including CVAs and three haemorrhagic strokes.

An undisplaced subcapital fracture was diagnosed. The Glasgow Coma Scale score was 14.

Following admission to the ED observation ward, a CT scan was undertaken (no fractures noted) prior to transfer to the orthopaedic ward. Over the ensuing 24 hours, the patient gradually became less and less rousable. Initially it was thought the patient may have been over-sedated, but subsequent CT scan showed a subdural collection causing herniation. The patient died some 36 hours after being admitted.

Comment

The presentation, an elderly person presenting with hip pain, is quite common, whereas in this specific case there was obviously a subdural haematoma collection, which eventually caused the herniation.

The assessor was unable to see any signs of the patient being given any anticoagulants, which could have accelerated the subdural collection. It was obviously not detected by the emergency staff, due to the fact that the patient's overall mental state was not disturbed.

The assessor concluded that the overall outcome may not have been any different if the patient had been admitted under orthogeriatrics or even under neurosurgery. It is unclear whether our neurosurgical colleagues would have considered evacuation of a haematoma, given the past comorbidities and the age of the patient, but at least an appropriate consultation would have been beneficial.

The assessor concluded that the four-hour rule, however politically charged it may be, was unlikely to have had any significant influence in the patient's outcome.

Case 18: Delay in drainage of pelvic abscess leads to septic shock

Summary

An elderly patient was admitted with a six-week history of increasing abdominal pain and shortness of breath. There was a multi-year history of recurrent ascites secondary to idiopathic sclerosing peritonitis and retroperitoneal fibrosis. Bilateral ureteric stents had been inserted two months previously for right-sided hydronephrosis. The multiple comorbidities included essential thrombocythemia treated by Aspirin and Hydroxyurea, ischaemic heart disease and atrial fibrillation, Type II diabetes and hypothyroidism. Past history included pulmonary tuberculosis, cystosarcoma phyllodes of the breast and perforated caecum following polypectomy, treated with resection and a temporary stoma.

Abdominal examination revealed generalised tenderness with mild distension. A CT scan showed a pelvic abscess. This was drained radiologically under local anaesthetic the day after admission, but the procedure was abandoned as the patient found the procedure too painful. Only 5 ml of pus was obtained along with 20 ml of straw coloured fluid. Intravenous antibiotics were commenced with a plan to repeat drainage of the abscess under general anaesthetic three days later.

This procedure took almost two hours, and eventually a 14 gauge pig-tail drain was inserted. Unfortunately, by this stage the patient was already developing septic shock with hypotension, acidosis and renal failure. Inotropic support with dopamine was commenced, but ICU admission was declined because of the patient's impaired pre-morbid mobility. In consultation with the family the patient was referred for palliative care and died three days later.

Comment

This patient's prognosis was always poor, but a delay of four days in establishing adequate drainage of the pelvic abscess was unreasonable. The abscess was loculated, and laparotomy with open drainage would have been more successful.

Although the patient was considered unfit for a laparotomy, the patient survived a two-hour general anaesthetic for the percutaneous drainage and almost certainly would have survived a laparotomy. Although earlier drainage and ICU admission would have prevented and managed the septic shock, it is suspected that the eventual outcome would have been the same.

Case 19: Timing of second-look laparotomies is important

Summary

An elderly patient was admitted to hospital with recurrent small bowel obstruction. The general surgical registrar diagnosed and appropriately managed the patient with IV fluids and NG tube aspiration. The following day the patient had a CT scan of the abdomen. The assessor's analysis of the images suggested the patient had small bowel obstruction consistent with an adhesion.

The patient failed to settle with conservative management within a 48-hour period and underwent a laparotomy and adhesiolysis by a consultant surgeon. The operation report noted dense adhesions, and two or three bands were divided which were thought to be causing the small bowel dilatation. Complete adhesiolysis was not performed.

The patient failed to settle postoperatively and had a series of repeat CT scans and gastrografen follow throughs. A second-look laparotomy and complete adhesiolysis was performed six days later. Total parenteral nutrition was commenced and an NG tube left in situ. The patient did not experience any abdominal pain. The high NG aspirates persisted and a gastroscopy was performed two weeks after the second laparotomy. The iSOFT report stated there were large amounts of fluid in D1, which was grossly dilated with the suggestion of luminal narrowing, possibly extrinsic. On the basis of this investigation the patient underwent a laparotomy and a Roux-en-Y gastrojejunostomy three weeks following the second-look laparotomy.

There were dense adhesions throughout the abdomen and multiple serosal tears. A gastrojejunostomy was performed with a feeding nasojejunal tube. The patient leaked from several of the enterotomies and underwent several laparotomies throughout the next few days. Each time attempts were made to suture close the enterotomies and the abdominal wall was closed until the fourth or fifth laparotomy, when the abdomen was left open. There are no further operation notes available to me, but according to the ICU comments, the patient did undergo further surgery in the abdominal wall. The patient eventually died.

Comment

Division of adhesions can be a difficult and complex procedure. It could be argued that a complete adhesiolysis should have been performed at the first operation. The second-look laparotomy was performed within a week of the first laparotomy and complete adhesiolysis was performed at this time and was probably appropriate.

Following adhesiolysis, some patients develop a prolonged ileus. At no time between the second and third laparotomy was there abdominal pain. This is consistent with an ileus rather than a true obstruction.

It appears that the decision to perform a Roux-en-Y gastrojejunostomy was based on the endoscopy of a dilated D1. It was brave to undertake this radical operation in such a patient. This was three weeks following the second-look laparotomy, where adhesions were known to be very unfavourable and the timing questionable. A more appropriate course may have been to maintain the patient with an NG tube and TPN given that the patient had no abdominal pain and to wait at least six to eight weeks.

Once the patient was on the pathway of laparotomies and inadvertent enterotomies, the inevitable happened. Attempting to close the abdomen each time probably increased the chances that the patient became septic.

Case 20: Failure to recognise septicemia

Summary

A very elderly patient, with a past history of congestive cardiac failure, saw their general practitioner with a four- to seven-day history of non-specific abdominal pain and vomiting. The general practitioner arranged a CT scan that documented cholecystitis with a necrotic wall extending into the liver. The patient was noted to be hypotensive while in the CT scanner.

The patient presented to an ED the afternoon of the CT scan and was admitted by a consultant. Timentin and Metronidazole were commenced. The surgical registrar review was timed at 17:00. The CRP was 241, bilirubin 24 and white cell count 16,000. The next medical note was recorded by the surgical registrar in the early hours of the following day, after a MET call.

The on-call surgeon was contacted at the time and requested that the surgical registrar contact the consultant who had initially admitted the patient. The previous consultant was not contactable. A decision was made by the on-call consultant for the patient to undergo a percutaneous cholecystostomy.

Percutaneous cholecystostomy was not available at that hospital and the plan was to transfer this patient to a tertiary site. While undergoing resuscitation in ICU there was cardiac deterioration and the patient died without having been transferred.

Comment

This was an elderly patient who clearly had acute cholecystitis, possible gangrenous cholecystitis, and was in septic shock on admission. There was no appreciation by the surgical team of the severity of the illness. This patient should have been transferred directly to either HDU or ICU.

It would seem that the night consultant was not aware and possibly did not receive a handover from the previous consultant. A sick patient like this should be handed over to the on-call consultant if the admitting consultant is not available for a further consultation, should deterioration like this occur.

The patient was critically ill on admission and earlier intensive care management and/or percutaneous cholecystostomy may not have averted the eventual outcome. However, time is of the essence in the management of elderly, septic patients and the delay in this case was certainly preventable.

Case 21: Rectal cancer surgery in a regional hospital I – postoperative bleeding in a no-blood patient after a low anterior resection

Summary

An elderly patient maintaining a refusal to receive blood products with a rectal adenocarcinoma in the upper rectum underwent a low anterior resection with a covering loop ileostomy at a regional hospital. The past medical history included an endovascular aortic stent, ischaemic heart disease, and previous transient ischaemic attacks managed by a right carotid endarterectomy two years before. Clopidogrel was ceased for over one week preoperatively. Preoperative staging did not show any distant metastases.

The procedure was technically difficult due to adhesions from the previous vascular interventions to the abdominal aorta. The surgery was otherwise uneventful and haemostasis appeared to be secure at the end of the operation. A drain was placed in the pelvis.

Clexane was withheld on the night of the operation and was administered the following morning. Twelve hours after the administration of Clexane the patient collapsed while ambulating to the bathroom. A diagnosis of hypovolaemia was made and a code blue was called. The patient was resuscitated with fluid and the surgical registrar was called due to low haemoglobin of 63 grams per litre on a venous blood gas and fresh blood in the drain. Blood transfusion was advised, but the patient declined blood. A second code blue was called half an hour later due to the patient becoming unconscious while lying in bed. By this time the diagnosis of postoperative bleeding had been made and arrangements were being made for an urgent laparotomy. There was now 800 millilitres of fresh blood in the drain and the patient had received 2 litres of colloid.

CPR commenced when blood pressure became unrecordable. The cardiac rhythm was noted to fluctuate between asystole and electromechanical dissociation. Adrenaline and atropine were given intravenously. Attempt at intubation was not successful. CPR continued without any return of circulation and on discussion with the patient's wife and family it was decided to stop CPR. The patient was declared deceased soon after.

Comment

This was an elderly patient with moderately significant comorbidities who chose to have an anterior resection in a regional centre. Once the bleeding occurred the outcome would probably not have been very different in a tertiary hospital. Clopidogrel appears to have been ceased for a sufficient time preoperatively. The issue of Clexane use and the timing of the first dose was raised.

The surgeon had to deviate from their normal practice of prophylactic Clexane on the night of the surgery and delayed the first dose until the next morning. The Clexane could not have been delayed much longer if adequate DVT prophylaxis was desired. Whether unfractionated heparin 5000U s/c bd should have been used instead of Clexane is a consideration. However, this may not have changed the outcome as the timing, severity and volume of bleeding suggests a technical problem rather than a pre-anticoagulation problem.

It might appear better if this patient had been operated on in a major tertiary hospital and gone to an HDU postoperatively, but given the patient's wishes regarding blood transfusion the eventual outcome may not have differed.

Case 22: Rectal cancer surgery in a regional hospital II – were the medical comorbidities more serious than previously thought?

Summary

An elderly patient who presented with a low rectal cancer had neoadjuvant chemoradiotherapy prior to an ultra-low anterior resection. The surgery was performed by an experienced surgeon in a regional centre. An echocardiogram two months prior to surgery demonstrated mild valvular disease and only mild aortic stenosis. At the preoperative assessment the anaesthetist deemed the patient fit for surgery in the regional centre.

The appropriately performed ultra-low anterior resection was uneventful and covered with a loop ileostomy. Postoperatively the patient went to HDU. Two days after surgery a low urine output and a high lactate were noted. A laparotomy was undertaken to exclude sepsis or mesenteric ischaemia. The laparotomy was unremarkable and the patient returned to the HDU.

There was an apparent review by a consultant physician and another echocardiogram which demonstrated that the patient now had severe aortic stenosis with a high gradient of 80 mm of mercury. There were considerable problems with pulmonary oedema requiring management with CPAP and BiPAP. A very slow recovery ensued until the seventh postoperative day when the patient suddenly developed severe pulmonary oedema and rapidly became unconscious. After discussion with the family, it was decided that there was little value in transferring the patient to a major centre for ICU care as treatment was likely to be futile. The patient died shortly thereafter.

Comment

The treating surgeon highlighted that the preoperative assessment may have been over optimistic. It seems all appropriate efforts were made to minimise the risks of surgery and peri- and postoperative care also seem to have been completely appropriate.

It is possible that the preoperative echocardiogram under-reported the degree of aortic stenosis. However, that is a comment made with the luxury of hindsight. The assessor concluded that the surgeon undertook all the appropriate investigations, and based on the information available the decision to undertake the operation in the regional centre was appropriate.