



QASM

Queensland Audit of Surgical Mortality



ROYAL AUSTRALASIAN
COLLEGE OF SURGEONS

LESSONS from the AUDIT

Volume III



Queensland Government
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*“There is only one thing more painful than
learning from experience, and that is not learning
from experience.” (Archibald McLeish)*

This booklet is produced for Fellows and trainees of the Royal Australasian College of Surgeons. Information is obtained under a quality assurance activity. Detail that may identify individuals has been changed, although the clinical scenarios are based on real cases.

Each case described in *Lessons from the Audit Vol 3* was selected by the Clinical Director in order to highlight a particular surgical problem. Reports by first-line and second-line assessors have informed the descriptions provided.

Dr Joh Cohen, QASM Clinical Director.



“Constipation” post-transurethral resection

An elderly patient presented with haematuria, and after investigation multiple bladder tumours were found. The patient had multiple comorbidities with a past history of mitral valve replacement (on warfarin), chronic obstructive airways disease and ischaemic heart disease. Transurethral resection (TUR) was performed and one area of full thickness penetration was noted in the base of the bladder. Pathology indicated high-grade transitional cell carcinoma.

The following day the patient pulled out the indwelling catheter and this was replaced and heavy haematuria was recorded. The day after this the patient’s haemoglobin was 95 and a transfusion was performed; the next day the patient became hypotensive and the surgical ward call was asked to attend the patient, whose bowels had not opened for three days. The following day the patient was reviewed by surgical ward call and it was noted that the haemoglobin level had fallen to 7.9; the white cell count was 21.5 and a diagnosis of constipation was made. Urine was sent for a microscopy and culture and intravenous antibiotics commenced.

That night the patient became hypotensive, had a low urine output and was transfused again with two units of packed cells. At this stage the patient was noted to have abdominal distension and signs of lower abdominal peritonitis, and a CT scan was ordered. This

indicated extravasation of contrast into the pre-peritoneal space with clot in the bladder and a laparotomy was performed. A bladder perforation was noted on the anterior wall and 400mls of clot was in the bladder. The peritoneal cavity was entered but there was no obvious intraperitoneal leak of fluid.

The patient was transferred postoperatively to the intensive care ward; however, the patient’s condition deteriorated over the next few days and the patient died about 13 days after the initial procedure.

Comment

The issue here is failure to recognise the complications of a bladder perforated at TUR. While perforation at TUR is not uncommon, the falling haemoglobin, rising white cell count, and abdominal distension and tenderness could not be explained on the basis of constipation. Constipation is not a diagnosis but indicates impairment of function, the cause of which should be investigated. A CT scan earlier in the course of this patient’s post-operative care may have alerted the team to the problem and hence earlier correction.



Bronchial stump leak


A patient in their 70's was admitted electively for resection of a carcinoma of the lung. Right lower lobectomy was performed and the bronchial stump was stapled closed. Histology revealed completely resected squamous cell carcinoma with negative margins and no nodes.

Postoperatively the patient had a persistent red to brown productive cough, high output chest drainage and severe chest pain even 5 to 6 days after the operation. The patient coughed up "brown foul-smelling expectorant" and this was noted on day 9 but not followed up. A diagnosis of stump leak was made on day 11 after intubation and bronchoscopy at which time 250ml of brown fluid was aspirated and an X-ray suggested pleural effusion. The patient was returned to theatre for exploratory thoracotomy and oversewing of the leaking bronchial stump.

When returned to theatre for this second procedure no bronchial blocker was used to protect the normal lung while rolling the patient to the side. Not unexpectedly the patient did not tolerate this manoeuvre and the rest of the operation had to be done with the patient lying flat. It is possible that this may have resulted in spilling fluid into this lung which later grew *Pseudomonas*. The patient seemed to improve following this procedure but the repaired bronchial stump broke down once again resulting in overwhelming sepsis and multi-organ failure.

Comment

The assessor noted that the bronchial dehiscence could have been identified a little earlier in the light of a productive cough, high output chest drainage and severe chest pain up to 5 or 6 days after the operation. The assessor commented on the anaesthetic handling at the second procedure, and also wondered whether a muscle flap could have been used at the first bronchial repair.




Perforated diverticular disease

An elderly patient with multiple comorbidities (chronic renal failure, hypertension, obesity) was admitted with a history of lower abdominal pain for 1 week. The patient had a tender mass in the left iliac fossa, a white cell count of 22.6 and a CT scan indicating a multiloculated pericolic diverticular abscess. The surrounding bowel loops and the multiloculated nature of the abscess made radiological drainage not an option and in view of the comorbidities and relatively stable clinical state a decision was taken to treat the patient conservatively with antibiotics.

The patient was transferred back to the original hospital but was readmitted a few days later when the patient's condition further deteriorated. The patient had become distended, was vomiting, and had a white cell count of 35.2 and haemoglobin 108. A decision was made to proceed to operation and a Hartmann's procedure performed. Admission to the intensive care ward followed postoperatively requiring inotropes and transfer to the ward occurred the next day. Initially the patient seemed to progress well but died 13 days later after deteriorating and worsening renal function.

Comment

Although this patient was high risk with multiple co-morbidities and deteriorating renal function, the situation on admission of an undrainable multiloculated pericolic abscess surrounded by loops of bowel makes the decision to proceed to surgery mandatory. The assessor felt (and indeed the surgeon on reflection) that early surgery may have been a wiser course of action.



Perforation of duodenum following ERCP

A patient in their mid-70's had an elective laparoscopic cholecystectomy for gallstones. There were no problems at operation but intraoperative cholangiogram was not performed. The patient was discharged the following day. The patient was readmitted 2 weeks later with abdominal pain and obstructive jaundice and an ultrasound revealed stones in the common bile duct.

Two weeks later endoscopic retrograde cholangiopancreatography (ERCP) was performed by a gastroenterologist with sphincterotomy and stone extraction and no problems were noted at the time. After the procedure the patient developed severe right-sided abdominal pain and the CT scan revealed a periampullary perforation. A surgical opinion was sought and the initial management was conservative.

Over the next 24 hours the pain worsened and the patient became unwell. Laparotomy was performed later that day.

At operation the surgeon performed a transduodenal repair of a 1cm perforation immediately lateral to the ampulla via a longitudinal duodenotomy. He also performed a choledochoscopy to exclude stones causing biliary obstruction and sepsis. A drain was placed behind the head of the pancreas and a biliary stent was placed across the ampulla.

The patient's condition deteriorated over the next week and a further laparotomy was

performed revealing a breakdown in the previously repaired perforation; after peritoneal lavage a larger drain was placed behind the head of the pancreas and gastrostomy and feeding jejunostomy performed. The patient's condition continued to deteriorate and the patient died about 12 days later.

Comment

Perforation of the duodenum is a well recognised and significant complication of ERCP. Although the initial conservative stance may have been acceptable, deterioration in her condition made exploration mandatory. Once that decision was taken, the procedure should have included pyloric exclusion with gastro jejunostomy to divert gastric content from the area insertion of a T-Tube into the common bile duct to divert bile either feeding jejunostomy or TPN accompanied by somatostatin to maintain nutritional support and reduce pancreatic secretion

Drainage and repair of the duodenal tear would have had a better chance of success if these manoeuvres had been undertaken. The assessor acknowledged that the need for this surgery is not common and very few surgeons have had experience in this area. A second opinion by telephone to a hepatobiliary unit may have pointed the surgeon in the right direction about the procedures that were necessary under these circumstances.




Mendelson's Syndrome

An elderly patient presented with a stage 4 carcinoma of the upper rectum. A lap-assisted anterior resection was performed and the initial postoperative course was uneventful although a little slow. On day 4 the patient had a high output ileostomy discharge associated with a tight distended abdomen and gradually falling urine output. Later that evening the patient vomited and aspirated causing acute respiratory distress. The patient was transferred to the intensive care ward, intubated and ventilated.

When intubated, gastric content was noted in the trachea. In spite of ventilation and inotropes the patient's condition deteriorated over the next few days and the patient died a few days later.

Comment

High output ileostomy discharge associated with a distended abdomen and a falling urine output should have alerted the surgical team to the presence of obstruction and a nasogastric tube should have been inserted at this stage. There was also some concern about the delay in transferring this patient to the Intensive Care ward after the aspiration had occurred.




Pulmonary embolus after discharge

A patient in their 60's had a right hemicolectomy performed for carcinoma of the right colon. The procedure was technically difficult because of multiple previous operations and adhesions. This led to a prolonged postoperative recovery although the patient was discharged after 18 days.

The patient was readmitted 6 days later with abdominal pain and vomiting but a CT scan did not show evidence of obstruction. The patient collapsed suddenly 17 days after admission and was thought possibly to have had a myocardial infarct. The post-mortem revealed a pulmonary embolus with no evidence of myocardial infarct.

Comment

Conventional DVT prophylaxis was given to this patient (heparin, TED and elastic stockings) but heparin was not continued after discharge. Conventional advice in patients at high risk for pulmonary embolus is to continue DVT prophylaxis (low molecular weight heparin) for one month after discharge from hospital.



Post-amputation death due to probable pulmonary embolus

A patient in their late 60's was transferred from another hospital for management of a gangrenous diabetic foot. The patient was a wheelchair bound vasculopath with multiple comorbidities.

The patient had a left below knee amputation 4 years earlier, past history of myocardial infarction, ejection fraction estimated at 40% on echo 4 years previously, type II diabetes mellitus, hyperlipidaemia and obesity. The patient had been on warfarin for 2 years for reasons that were unclear.

An above knee amputation was performed without incident and with minimal intraoperative blood loss. Although it was planned to continue with subcutaneous heparin postoperatively, there is no record of this having been given. The patient had an uncomplicated early perioperative recovery and was transferred to a rehabilitation unit.

Approximately 4 weeks postoperatively the patient developed sudden onset of shortness of breath associated with oxygen desaturation to 92% on room air and a ventilation perfusion scan confirmed "intermediate probability of recent pulmonary embolus". CTPA was not performed because of the patient's chronic renal failure. The patient was heparinised with an intravenous heparin infusion but whilst

being hoisted onto a shower chair they became cold and clammy and unresponsive and could not be resuscitated.

Comment

The assessor noted the lack of identifiable orders for post-operative venous thromboembolic prophylaxis in this high-risk patient. He felt that "failure to implement appropriate prophylaxis is an error made by both the treating surgical team and the rehabilitation team".




Pulmonary embolus following laparoscopic repair of large ventral incisional hernia

An elderly morbidly obese patient was admitted for laparoscopic ventral hernioplasty. The procedure took 3 hours but was uneventful. The postoperative course was proceeding well until the patient developed sudden chest pain in the shower on the fourth postoperative day and died soon after. A post-mortem confirmed a pulmonary embolus.

Comment

This patient was described as “severely, morbidly obese” and the laparoscopic procedure seemed appropriate. The patient was given DVT prophylaxis with low molecular weight heparin, compression and TED stockings. In spite of the prophylaxis, the patient’s obesity and 3 hours on the operating table added extra risk factors for pulmonary embolus.




Mesenteric ischaemia – delayed diagnosis

A morbidly obese patient in their 60’s was admitted with abdominal pain and shortness of breath. A CT of his abdomen was initially reported as normal but on review the following morning an occluded superior mesenteric artery was seen. An electrocardiogram showed ST elevation in the inferior leads and a diagnosis of acute myocardial infarction was made and thrombolysis commenced. Persistent abdominal pain was interpreted as ‘referred angina’ and the patient was transferred to coronary care. Deterioration in his general condition occurred the following morning with hypotension, metabolic acidosis and increasing abdominal pain and tenderness. A laparotomy was performed revealing extensive necrosis of the small bowel and the patient died soon after.

Comment

There were many comorbidities in this morbidly obese patient who had a past history of CVA and high anterior resection for colon cancer 5 years previously. Although misinterpretation of the initial CT delayed diagnosis, earlier diagnosis probably would not have altered the outcome.



Mesenteric ischaemia – delayed diagnosis

An elderly patient was admitted with a 7-day history of abdominal pain, nausea and productive cough. There was generalised abdominal tenderness and a CT of the abdomen suggested small bowel ischaemia with extensive calcification in the superior mesenteric artery, and a possible caecal mass. In spite of this CT report and persisting abdominal pain, conservative management was continued, and on the third day the patient collapsed and could not be resuscitated. A subsequent post-mortem revealed a large loop of infarcted jejunum and this was the cause of death.

Comment

The assessor noted that elderly patients often have subtle symptoms and signs and often show little inflammatory response to major insults. “It is well known that there is a discrepancy between the severity of symptoms and the paucity of signs in bowel ischemia.” The original CT scan highlighted the suspicion of mesenteric ischaemia but no action was taken. In spite of the persistence of abdominal pain, laparotomy was not considered so no attempt was made to correct the problem. Laparotomy within the first 24 hours may have resulted in a better outcome.

Complication of coronary angiography

A patient in their late 60’s was admitted for above knee amputation for an ischemic leg. On the third postoperative day the patient complained of chest pain, was seen by the cardiology team and a coronary angiogram arranged. During the procedure the left anterior descending coronary artery (LAD) became occluded leading to rapid deterioration in the patient’s condition with marked hypotension. The patient was given heparin intravenously, Aramine and a Dopamine infusion, but soon after had a ventricular fibrillation arrest. The patient remained hypotensive following the procedure was transferred to ICU and died 24 hours later.

Comment (angiographer)

“There was severe proximal left main stenosis on angiography and the LAD was occluded flushly at the ostium (likely patent when first imaged). The left circumflex was a dominant vessel with only minor disease and the right coronary artery was a modest vessel with a 99% stenosis in the mid-vessel just after the origin of a large right ventricular marginal branch. Acute occlusion of LAD during the procedure precipitated deterioration”.



Complication of coronary angiography

A patient in their late 70's had a 4-week history of exertional chest pain and shortness of breath. The patient had a history of hypertension, hypercholesterolaemia and chronic renal disease. The patient was admitted for angiography and during the procedure developed cardiac tamponade after the left anterior descending artery was ruptured during percutaneous transluminal coronary angioplasty. Drainage was attempted but was put into the right ventricle and the patient was transferred to a cardiothoracic unit at a different hospital. The patient died within minutes of arriving at the second hospital.


Comment

The assessor identified three areas of consideration/concern:

The tamponade needed to be drained before the patient was transferred.

Drainage was attempted but put into the right ventricle.

If coronary angiography is offered as a service, a cardiothoracic service should be available at that hospital as a back up.




Haemorrhage from a cerebral tumour during pregnancy

A woman with a 38-week gestation had a 2-week history of headache, nausea, lethargy and blurred vision. The patient reported this to her midwife one week prior to her critical decline and she was referred to an optometrist who apparently suggested her vision would improve following delivery. She subsequently became unconscious and collapsed, was admitted to hospital where a CT scan showed a midbrain tumour with intratumoural haemorrhage. Although a live healthy baby was delivered by caesarean section her neurological state was irreversible with fixed dilated pupils and she died 48 hours later. Her family refused a post-mortem.

Comment

Failure to obtain expert medical assessment at the time of onset of her symptoms delayed accurate diagnosis. If the midbrain tumour had been choriocarcinoma, this usually responds well to chemotherapy and has a 60–70 percent survival rate.



Death following elective total hip replacement

A patient in their late 60's was admitted for an elective total hip replacement. Multiple comorbidities included ischaemic heart disease, hypertension on treatment, chronic obstructive airways disease and chronic bronchitis. The patient had smoked 20 cigarettes a day for 40 years and had hypercholesterolemia, hypothyroidism and peripheral vascular disease.

Anaesthesia was under a spinal block and Propofol infusion for sedation. A service registrar commenced and completed the surgery under a consultant's supervision. Anaesthetic duration was 3 hours 50 minutes and surgical duration was 2 hours 23 minutes. The operative notes describe a need to ream the medullary canal in order to insert a larger femoral stem to improve implant offset and there appears to have been excessive blood loss.

Approximately 90 minutes into the procedure, the patient became hypotensive, developed a sudden bradycardia and a code blue was called. The patient was turned prone, intubated and cardiopulmonary resuscitation commenced lasting 6 minutes until the patient stabilised. The patient was subsequently transferred to the care of the intensive care unit but remained haemodynamically labile and had at least two documented resuscitations until the patient's final demise. The suspected diagnoses were cardiopulmonary failure as a result of either fat or air embolus, with the cement polymerisation being an added insult. There was also an element of hypovolemia.

Comment

The assessor felt the patient had been well worked up and that the problems at operation well-handled but made the point that the consulting surgeon should have taken over the operating role earlier in the procedure and informed the anaesthetist re blood loss prior to cementation.




Ruptured abdominal aortic aneurysm

A patient in their 60's with multiple comorbidities (diabetes, COPD, previous myocardial infarct and chronic renal failure) presented with an abdominal aortic aneurysm and was rejected for elective repair on the basis of comorbidities. The patient was ASA grade 4 (incapacitating systemic disease that is a constant threat to life).

The patient then presented with a ruptured abdominal aortic aneurysm and in spite of the previous decision, requested surgical treatment and was taken to the operating theatre. The procedure was technically difficult and the patient continued to bleed after initial closure. When a second laparotomy was proposed, the family decided to withdraw treatment.

Comment

The assessor (as did the surgeon) questioned the decision to operate in a patient who had been refused for elective repair on the basis of multiple comorbidities.




Perforation following colonoscopic “polypectomy”

An elderly patient had a flexible sigmoidoscopy and attempted snaring of a sigmoid tumour (procedure lasting 1½ hours). The patient was discharged “with a risk of postoperative bleeding” and advised to attend the local emergency department if unwell. The following day the patient presented to a major hospital with faeculent peritonitis and a Hartmann's procedure was performed. The patient was transferred to the intensive care unit but died from overwhelming sepsis.

Comment

This patient had a prolonged and presumably difficult snaring of a sigmoid tumour at colonoscopy. Perforation under these circumstances is not uncommon and adequate provision should have been made for the patient's follow up.





*“You must learn from the mistakes of others.
You can’t possibly live long enough to make them
all yourself.” - (Sam Levenson)*



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