Royal Australasian College of Surgeons

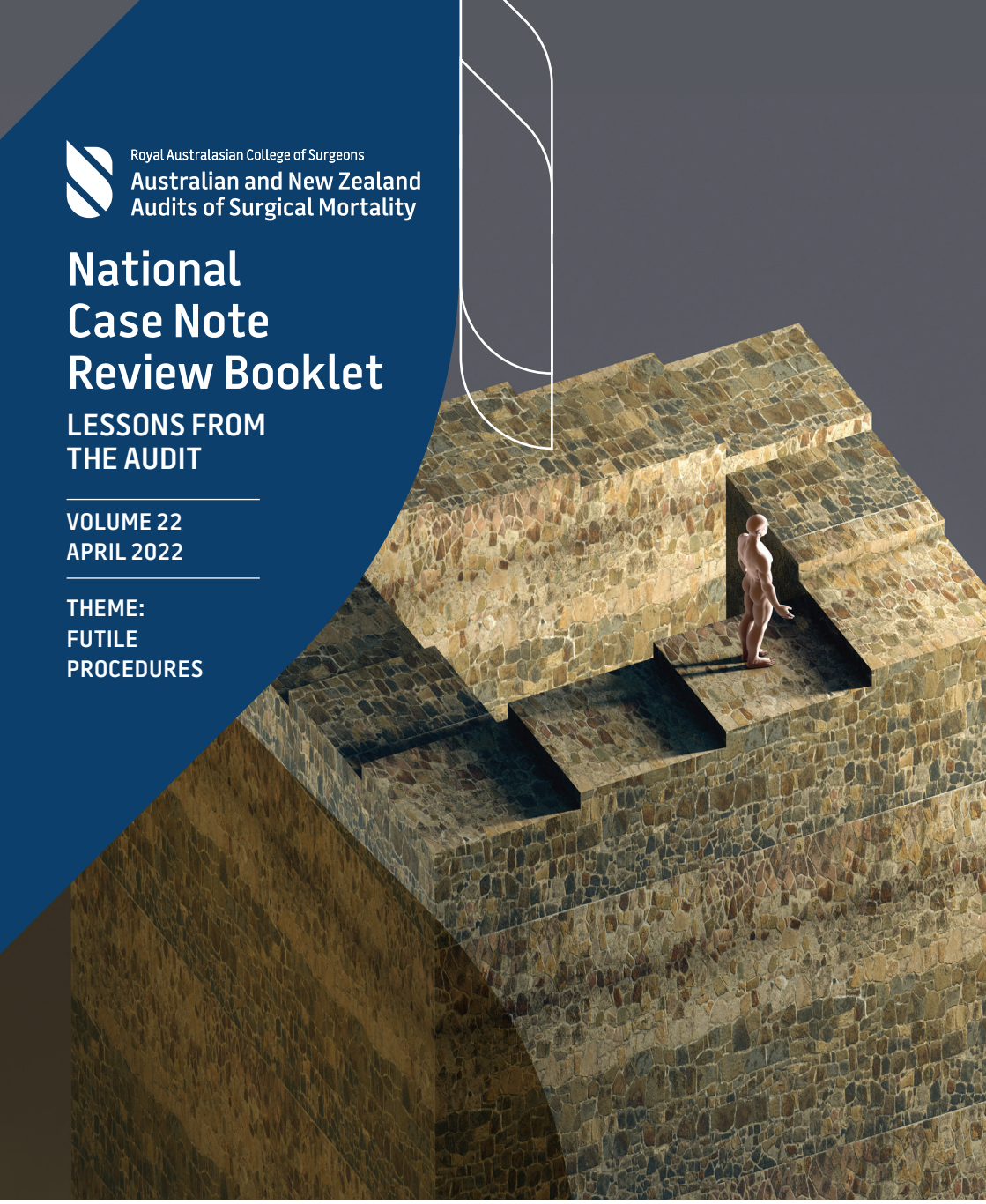
Australian and New Zealand Audits of Surgical Mortality

National Case Note Review Booklet

LESSONS FROM THE AUDIT

VOLUME 22
APRIL 2022

THEME:
FUTILE PROCEDURES



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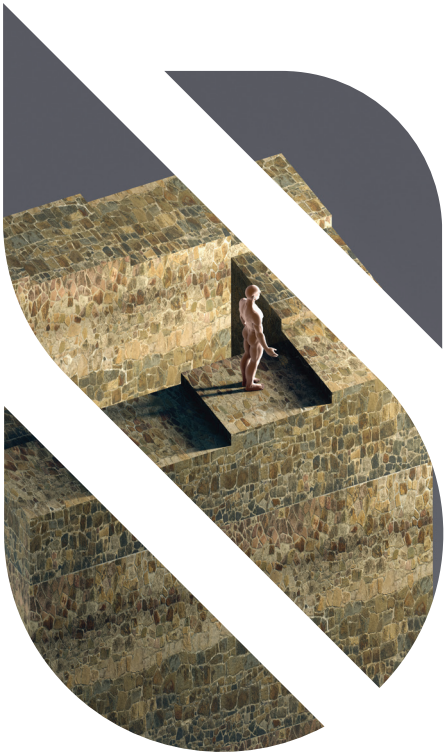

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Contents

Guest Chair's Report

This booklet examines a series of cases from around the country and includes patients from all specialties. In each case, the assessor expressed concern regarding the necessity of an operation or the choice of operation. There are some recurrent themes that all surgeons can learn from around the country.

The assessors' comments draw attention to surgery that was not justified, lacked adequate preoperative assessment, failed to provide detailed informed consent, lacked multidisciplinary discussion and omitted documentation of goals of care.

In 2015, the United Kingdom Supreme Court case of Montgomery v Lanarkshire Health Board fundamentally changed the practice of consent in that country. That court found doctors have a duty to ensure patients are aware of all 'material risks'. In a high-risk setting, mortality would likely be considered a material risk whether or not an operation is recommended. Although Australian courts cannot cite this decision as a precedent, they may find it persuasive.

With that background, it is important to appreciate that all patients included in this booklet were high risk, even very high risk, and for many there was more than one treatment option and some that should have included no surgery. The assessors frequently commented on the lack of documentation recording the extent of any preoperative discussion. In a few cases, that may have been because the preoperative assessment was undertaken by another clinician, but it would seem incumbent for the surgeon to know what had been discussed.

It would certainly be helpful to the ANZASM assessors if surgeons ensured that they included a record of any preoperative assessment. For example, the preoperative letter to the general practitioner can be attached to the ANZASM record.

In patients undergoing high-risk surgery, a completed goals-of-care form is a clear way to show that risks have been anticipated and discussed, and the form can accompany the patient if their care is transferred. The decision not to offer surgery because the patient is high risk is sometimes a life-limiting one. Predictably, many of these patients will have a subsequent presentation, often as an emergency, so the discussion on whether or not to offer surgery should be used as an opportunity to formally document the care goals. A number of these reports were critical that the goals of care had not been documented.

All these cases were high risk and in many the decision-making was complex. The assessors frequently expressed concern at the lack of consultant input.

The development of a complication can change what was initially a low-risk

operation into a high-risk situation. Numerous 'failure to rescue' studies have shown the final outcome is often determined by the management of the complication rather than the complication per se. A complication is stressful for a surgeon, not least as the best treatment is not always obvious. Multidisciplinary discussions will not only help determine the best treatment strategy but will also provide the surgeon with support. The assessors felt some cases would have benefited from such multidisciplinary discussion.

My personal impression after reading around 700 second-line assessments is that when a patient deteriorates their treatment is frequently prolonged when there is no realistic prospect of recovery. In the very unlikely event of recovery, the patient's subsequent quality of life would predictably be very poor with the certain loss of independent living that for many patients is more important than mortality. This prolonged treatment is frequently not of the surgeon's making but is driven by unrealistic expectations, sometimes of the patient but more often the family. In this situation, discussion is greatly facilitated if the patient's goals of care have been previously documented.

Looking to the future, there is increasing interest in recording an objective risk assessment. In one case, the assessor calculated the risk retrospectively. There are already a number of digital applications, some generic but others associated with specialty or even operation specific, that provide a documented risk of mortality or complications. These should only be used as an aid and are not a substitute for clinical assessment. However, patients can relate to 'a number' and they provide a valuable platform for discussion. If the calculated risk is very high, it can be a trigger for multidisciplinary discussion, support a decision not to operate and certainly assist goals-of-care discussions. The information can also be saved and made available later.

ANZASM has shown that over the years the number of patients for whom the assessors recorded futile surgery has progressively fallen. However, as these reviews show, there is scope for improvement.

James Aitken
Clinical Director, Western Australian Audit of Surgical Mortality

Case Studies

Case 1: Postoperative death in a frail patient subject to inappropriate extended surgery

Plastic Surgery

CASE SUMMARY

This 91-year-old woman presented with a number of skin lesions, including a large one on her chest that was causing her concern. Prior to the intervention, the patient and family member were informed of the risks and decided to proceed with excision of multiple lesions under General Anaesthetic (GA). Postoperatively, her condition fluctuated with challenges in fluid balance and analgesia. She was reviewed by all the appropriate teams—surgical, anaesthetic and medical—in a timely manner. The family were consulted by the teams due to the deteriorating condition, and a plan of comfort care was put in place. The woman died peacefully 3 days post-surgery.

DISCUSSION

The notes, despite reflecting the decisions undertaken, were done by nursing staff, junior medical staff and, in retrospect, by the anaesthetist. There is no evidence of the surgeon documenting the discussion and no explanation of why all lesions were excised rather than just the large chest one that was causing her concern. Although it may well have been reasonable to do so, there is no information to understand the decision. This is concerning. Of note, the Goals of Patient Care form was in the notes but not completed.

CLINICAL LESSONS

More detail in the surgical case form reflecting the clinical decision-making process and the understanding of the patient and family would have been very useful.

Case 2: Aortic stenosis I - Even small procedures can be lethal in the elderly with severe aortic stenosis

Cardiothoracic

CASE SUMMARY

An 84-year-old man presented after experiencing exertional dyspnoea for several months. He had a history of right lower lobectomy for stage II lung cancer 5 years previously and a coronary artery bypass graft (CABG) 3 years previously.

The patient was found to have severe aortic stenosis (AS) and moderately impaired left ventricular function and a large left-sided pleural effusion and was admitted for workup for transcatheter aortic valve implantation (TAVI). He was referred for drainage and diagnosis of the pleural effusion. If the effusion was malignant then TAVI would not be indicated. He underwent left-sided video-assisted thoracotomy and the fluid was drained, pleural biopsies performed, and talc insufflated for pleurodesis.

Postoperatively, the patient became hypotensive and was transferred to the Intensive Care Unit (ICU). He received a noradrenaline infusion and oxygen. His pain was poorly controlled as he was said to be allergic to a number of narcotics. He had retained secretions with a poor cough, and thus was started on celecoxib.

He was transferred back to the ward but did not progress well. He became oliguric and his creatinine rose, and was subsequently readmitted to ICU. His chest X-ray deteriorated and gas exchange also became an issue with increasing oxygen requirement. He became agitated, confused and required sedation. He had vomiting and potentially some aspiration. He developed respiratory failure and was reviewed by a respiratory physician. It was felt that talc pneumonitis could be involved, and hydrocortisone was commenced.

The patient's condition continued to deteriorate, and he was reviewed for the possibility of a balloon valvuloplasty. This was considered inappropriate.

The family were consulted, and a decision was made not to escalate care. He continued to decline and died 8 days postoperatively.

DISCUSSION

This patient probably presented with heart failure secondary to severe AS. The pleural effusion was probably secondary to the heart failure; however, it was essential to rule out a malignant cause of the effusion before proceeding with TAVI. In the setting of severe AS any intervention can be poorly tolerated.

CLINICAL LESSONS

An option in this setting would have been to drain the effusion with a catheter and do cytology on the fluid. This would also have improved his symptoms. The video-assisted thoracoscopic surgery, particularly with the addition of talc pleurodesis, was too aggressive in this setting. Talc can be poorly tolerated in the frail elderly patient and needs to be used with caution.

The subsequent downhill course was predictable. A PET scan could have helped to define the cause of the effusion and discover malignancy.

Case 3: A series of poor surgical decisions may have been avoided by multidisciplinary discussion

General Surgery

CASE SUMMARY

A 73-year-old man with metastatic colorectal cancer who had undergone a right hemicolectomy and right hemihepatectomy complicated by an ongoing bile leak and pulmonary emboli was admitted for percutaneous drainage of a perihepatic collection after removal of his drain. The indication was constant right upper quadrant pain. He was asked to attend the Emergency Department (ED) the day prior to this planned procedure to allow for the change to a heparin infusion and ceasing of his enoxaparin. On admission he was afebrile and his abdomen soft. The bloods for the whole admission are unavailable to review.

Following the percutaneous drain, the patient developed systemic inflammatory response syndrome (SIRS) within hours. This was attributed to a septic shower from infected bile by the surgical registrar who commenced IV antibiotics for biliary organisms and requested ICU input. The ICU registrar felt admission to ICU was unwarranted. Approximately 90 minutes later, a medical emergency team (MET) call for hypotension occurred with subsequent review by another ICU registrar, but the patient was determined to be stable enough to remain on the ward with simple fluid resuscitation and antibiotics. Gram stain from the initial bile 12 hours later showed a gram positive cocci and gram negative bacilli, so the antibiotics were broadened to include gram negative bacilli. A note is made at this time of a difficult to interpret magnetic resonance cholangiopancreatography (MRCP) and potentially no left duct filling and with ongoing bile leak. The extrahepatic biliary system is not identified.

Six days after the drainage and with the sepsis controlled by broad spectrum antibiotics, a decision was made to perform a segment 2/3 hepatectomy. At this stage his liver function had deteriorated and a gastroenterology opinion was sorted. Specifically, his albumin was 14, International Normalised Ratio was 3.3. The gastroenterology team felt it was all due to the acute illness and not a sign of parenchymal liver disease.

The planned surgery was still considered necessary. On the morning of surgery, ICU staff were consulted and the team was informed that no bed was available and that surgery should be rescheduled. Despite this, surgery went ahead. At surgery, a hole in the small bowel from the percutaneous drain was found along with associated contamination. No extra hepatic biliary structures were able to be

identified. Segments 2 and 3 were still resected. There was no structure identified to perform a biliary reconstruction, and when a second consultant came to assist, the decision was made to abandon any attempt at this so as to not cause more damage.

The patient returned to ICU. Postoperatively he failed to thrive and developed renal and hepatic impairment. Review by the renal team suggested a multifactorial injury of sepsis, hypotension and nephrotoxic antibiotics. The infectious disease team was also involved and suggested continuation of the antibiotics in view of the ongoing sepsis. The treating team arranged initially for a percutaneous transhepatic cholangiogram to drain the liver but ultrasound and MRCP showed no dilated ducts so this was abandoned and an endoscopic retrograde cholangiopancreatography was performed. The duct was unable to be cannulated. The procedure note suggests that bile was seen.

Approximately one month later due to a combination of sepsis, liver and renal failure and failure to progress, the patient and his family requested a palliative approach.

DISCUSSION

There are a number of areas in this case that raise concern. Although made prior to the admission, the decision to remove a drain that was functioning in a patient with no obvious extrahepatic biliary flow and an obvious biliary leak is the first decision that is hard to justify.

The subsequent admission and percutaneous drainage was the correct path but to suggest that this was an emergency presentation, when it would appear the need to provide anticoagulation by a different means was the indication for admission, is not correct.

Once the percutaneous drain occurred, the attribution of the SIRS response to a septic shower, hours after a difficult percutaneous drain with only fleeting consideration of the preceding event being responsible, raises questions about the experience of the staff. There is no record for several days of a consultant actually reviewing the patient or guiding care throughout this period.

The management of a septic complex patient with narrow spectrum antibiotics after a prolonged drain and multiple procedures is not best practice. The current sepsis guidelines would encourage volume resuscitation but earlier inotropes support was probably required, and I believe this patient should have been managed in an ICU environment.

Why surgery continued once the bowel injury was identified as the source of the sepsis rather than an obstructed system, it is difficult to justify. Upon finding this,

a simple small bowel resection and appropriate drainage to manage the bile leak and sepsis may have provided the time to allow the patient to recover to undergo a planned reconstruction with a team approach.

This case was obviously difficult and one is not sure that the junior staff who have been recording the notes were fully aware of the complexities involved. There does appear to have been very little consultant input throughout, which is a concern. The patient had an elective procedure when in an advanced septic and malnourished state, and there is no justification or answer as to why this occurred. There is no preoperative mention of a multidisciplinary approach or of a team meeting or second opinion. The final demise of this patient through a combination of multi-organ failure due to sepsis, malnourishment, lack of reserve and potential drug toxicity was not unexpected. At each stage of this case it is a struggle to determine what the desired outcome was for the intervention that occurred and how the patient would have benefited. Was the patient informed of the likely negative outcome of surgery in such a poor nutritional state? There is no documentation to this effect, nor of any of the decisions that were made.

CLINICAL LESSONS

This case raises serious concerns around practice in isolation, record-keeping and supervision. It is a timely reminder that difficult complex cases should always be discussed between colleagues and preferably in a multidisciplinary manner with all decision-makers present. Finally, consultant-led care must be a standard we uphold, which does not appear to be the case here.

Case 4: Poor choice of operation for rectal cancer surgery led to inevitable complication

General Surgery

CASE SUMMARY

The case involves a 64-year-old man with significant medical comorbidities including ischaemic heart disease, hypertension, a pacemaker and chronic obstructive pulmonary disease with a requirement for home oxygen.

The patient was referred by another surgeon, with the referral stating that the patient had been an inpatient with an exacerbation of chronic obstructive pulmonary disease and during that time it became apparent that he had rectal bleeding and weight loss. A colonoscopy was undertaken and a suspicious lesion was identified 10 cm above the anal verge. The lesion was partially excised by snare excision. Pathology revealed adenocarcinoma. The referral was made for ongoing management with the possibility of some form of transanal procedure being considered because the referring surgeon's anaesthetic colleagues did not think the patient was fit for laparotomy.

Preoperative staging by MRI scanning was not possible because of the patient's pacemaker, which meant that the usual preoperative staging information was not available to the operating surgeon. This was unfortunate as transanal minimally invasive surgery (TAMIS) procedures are generally only suitable for superficial cancers with T1 local staging. In the event, this tumour proved to be T3 with full-thickness penetration through the rectal wall.

Irrespective of that, the operating surgeon in their letter back to the referring surgeon 2 weeks after the initial referral stated that a TAMIS procedure was to be undertaken to completely excise the residual cancer and make an assessment about the depth of invasion.

The operation report describes the tumour as being anterior and higher (5 cm above sphincters) than first thought. Despite the anatomic location (10 cm above the anus and not palpable digitally) suggesting that the lesion was at least in the mid-rectum and therefore likely to be above the peritoneal reflection, the TAMIS procedure went ahead. The operation report states the pneumorectum was not able to be maintained and on inspection of the collapsed rectum there was visible peritoneum and small bowel present. A laparoscopy was then undertaken and a large defect in the rectum was identified. A lower midline laparotomy was ultimately performed and a low Hartmann's procedure undertaken. The

anaesthetic record indicates that the operating time was in the order of four-and-three-quarter hours. Postoperative histologic evaluation of the resected surgical specimens revealed a T3 adenocarcinoma implying full-thickness penetration of the tumour through the rectal wall into the perirectal fat.

There were a number of postoperative problems including hypotension, acute pulmonary oedema and several hypoxic episodes.

Four days postoperatively, a care conference was held with the patient along with his daughter and appropriate surgical and ICU specialists. At the patient's request, active treatment was withdrawn and he was transferred to palliative care where he passed away 6 days postoperatively.

DISCUSSION

In this case there are several clinical features that suggest that the choice of operation of TAMIS to manage what was an anterior mid-rectal cancer was highly likely to produce the rectal perforation that in the event did occur, necessitating further treatment.

In particular, the operating surgeon stated that the anterior location and body habitus of the patient meant that a full-thickness excision at this location resulted in rectal perforation. In this type of patient, the anterior peritoneal reflection typically lies 7–8 cm from the anal verge. The tumour lay at 10 cm above the anal verge, and the operating surgeon stated that not only was the tumour anterior but that it was higher than first thought. The operating surgeon stated that because the lesion was proven adenocarcinoma, full-thickness excision was required and given that, rectal perforation as occurred was virtually to be expected as an outcome in this case with the use of TAMIS.

Under the circumstances, full-thickness rectal perforation in the performance of TAMIS was so likely that this might have been discussed in much greater detail with the patient and the patient's daughter. In particular, a management plan should have been put in place for this likely event.

While a low Hartmann's procedure was considered to be the appropriate operative choice once the rectal perforation had occurred, this committed the patient, who had already been deemed unfit for laparotomy, to a major abdominal procedure by laparotomy lasting four-and-three-quarter hours. Although with further intensive care the patient may have survived, after a 4-day period he requested withdrawal of active treatment in favour of palliative care and his wishes were respected, leading to his demise 6 days postoperatively.

It is more likely than not that the magnitude of the operation required to deal with the expected full-thickness rectal perforation following the use of TAMIS excision

resulted in the postoperative complications and, given a previous anaesthetic assessment that the patient was not fit for laparotomy, these complications were directly responsible for the patient's death.

An alternative choice of treatment may well have been more prudent. Once the perforation occurred, direct repair of the rectal perforation by suture using the TAMIS technique could have been undertaken and a relatively straight forward laparoscopic elevation of a loop ileostomy undertaken. This would have been a far simpler operation of a considerably lower order of magnitude than the one that was undertaken and may have led to fewer and less serious postoperative complications than the ones that did arise.

Although it might appear that the patient had no choice but to undergo surgical excision of the rectal cancer, it is clear that a transanal attempt at surgical excision was always likely to result in rectal perforation. This likelihood may have been better anticipated at the time of the initial examination under anaesthetic, at which time the decision might have been made not to proceed to surgery of that nature and rather have further discussions with the patient and family about a course of palliative radiotherapy for the residual rectal tumour. While the outcome of such radiotherapy in a given individual is not predictable, there is good evidence that many such patients do respond to treatment for a reasonable period of time and given that this patient's overall longevity was clearly limited by his medical comorbidities, may well have been a therapeutic option worth considering in more detail.

CLINICAL LESSONS

The operating surgeon clearly stated that the tumour was anterior and higher than likely thought in terms of its height above the anal verge. This means that the location of the tumour was above the peritoneal reflection and full-thickness excision of the tumour was highly likely to cause perforation. At the time of that assessment it may have been worthwhile to avoid proceeding to further surgery and to instead discuss with the patient and family the option of palliative radiotherapy.

Proceeding to a lengthy open abdominal procedure was highly likely to produce postoperative complications as did occur. Under the circumstances, the choice of a TAMIS procedure in this individual with such a high likelihood of rectal perforation is an area for consideration and contemplation.

Case 5: Elective removal of cardiac tumour in an elderly asymptomatic woman was probably not appropriate

Cardiothoracic

CASE SUMMARY

An 81-year-old woman, asymptomatic, presented with an incidental finding of a small mobile mass in the left ventricle. The mass was first detected on surveillance echocardiogram one year prior. She had a history of CABG, coronary artery disease with stenting, hypertension, chronic renal failure and dyslipidaemia. At the time of presentation, a repeat echocardiogram showed the mass to be essentially stable, albeit marginally smaller.

There was mild to moderate mitral regurgitation and mild to moderate tricuspid regurgitation with left ventricular function estimated at 40%. As indicated on the surgical case form, the surgeon graded the American Society of Anesthesiologists (ASA) score as 5, yet the case is listed as elective. The preoperative diagnosis was a left ventricular fibroelastoma, a very rare tumour, especially in the left ventricle. They are usually attached to the aortic valve or mitral sub-valvular apparatus. The decision was taken to offer the patient surgical removal of the mass via redo sternotomy. Damage to the aortic valve and occlusion of the right coronary artery occurred during the procedure. Despite placement of an intraoperative balloon pump and subsequent stenting of the right coronary artery, the patient deteriorated and died of cardiogenic shock 3 days later.

DISCUSSION

The first, and overriding area of concern, is why this patient was offered surgery in the first place. She was 81 and asymptomatic with previous cardiac surgery and multiple comorbidities and the mass had been stable for at least a year. There is no evidence the case was discussed at a multidisciplinary meeting, nor the risk of non-intervention entertained. The fact that serial echocardiogram measurements over a 9-month period showed a minimal diminution of size and an otherwise stable setting should have raised considerable thought for conservative management.

The operative notes are lacking any significant detail, making it impossible to comment on what were clearly intraoperative complications. Most of the details of the case are gleaned from the ICU progress notes, which are thorough. Of further concern are the errors in the surgical case form: a score of ASA 5 in an

elective, asymptomatic patient and the listing of mesenteric ischaemia as the cause of the multi-organ failure, when it is clear from the notes it was due to cardiogenic shock. Mesenteric ischaemia is not recorded in the ICU progress notes. It is noted that this case occurred in a private hospital where multidisciplinary teams are either absent or less likely to be as considered or comprehensive as in a large teaching unit. This case would have benefited from such discussion.

CLINICAL LESSONS

Given the patient was elderly, asymptomatic and had multiple comorbidities, surgery should never have been an option. This clearly demonstrates the importance of multidisciplinary meetings were such cases can be thoroughly discussed and decisions reached.

Case 6: Aortic stenosis II – no operation might have been a better choice

Cardiothoracic

CASE SUMMARY

This case concerns an 83 year-old woman with severe AS and coronary artery disease who was deemed not a TAVI candidate on technical grounds, and proceeded to aortic valve replacement and a CABG. The procedure itself was uncomplicated; however, a number of postoperative complications including stroke, acute on chronic renal failure, and respiratory failure with prolonged respiratory wean led to an extended ICU stay that eventually resulted in death approximately one month postoperatively.

This patient was a high-risk surgical candidate given her age and other medical issues which included ischaemic heart disease (reported to have chronic total occlusion of the right coronary artery and moderate left anterior descending coronary artery disease), type 2 diabetes on insulin, obesity, chronic anaemia, severe chronic obstructive pulmonary disease (FEV1 = 1.0 L) and chronic kidney disease (eGFR 33).

DISCUSSION

When presented with such a patient in the current era, a TAVI should be considered and this appears to be the case here. Although the exact details of the workup were not found in the case notes provided, it appears she had a CT scan to determine the annular sizing to allow for valve selection, as well as assessments of the coronary height to ensure valve deployment would not result in coronary occlusion. The surgical case form states that a TAVI was deemed not suitable due to small annular size and low coronary heights. This led to a surgical pathway.

One wonders if, once the decision was made not for TAVI, a decision not to operate at all would have been more appropriate. She certainly was a high-risk surgical case given the above. Another choice could have been a balloon aortic valvuloplasty (BAV), which may have been appropriate given both surgery and TAVI were not good options. Even though a BAV would only have given short-term relief to the severe AS, it could have been repeated. Also, at the time of the BAV the coronary heights could have been assessed if this was a close call on the CT. A BAV may have represented a good ‘halfway house’ as a compromise between doing nothing and operating.

In terms of the preoperative preparation of the patient, as mentioned earlier, there was little detail provided in the case notes to make a comment on this, and it would have been preferable to see formal reports of her echo, coronary angiogram and formal TAVI workup. It appears from the limited information available that the workup was complete.

Finally, the surgical case form made mention of the fact that cross-matched blood was not available at the moment of weaning from bypass, and the surgical team was not made aware of this prior to that point. This may have led to some of the complications encountered.

CLINICAL LESSONS

In summary, this was a high-risk case with the decision to operate at all being a major factor, although this is with the benefit of hindsight and the knowledge that saying 'no' in this situation is a difficult decision to make.

Case 7: Surgery unlikely to be of value

Neurosurgery

CASE SUMMARY

This 81-year-old man presented with a history of progressive balance loss. There was a background of a known tumour in the left cerebellopontine angle, previously diagnosed as an acoustic neuroma (vestibular schwannoma). It had been present for at least some years, but there had been minor increase in size over a 12-month period. In addition, the patient had experienced increasing balance difficulties.

There were very significant comorbidities in that there were several malignant conditions present, including bowel cancer with liver metastases.

Prior to operation it was noted that the patient was confused and unable to give informed consent, but his relatives were told of the risks. Indeed, a previous neurosurgeon had advised against surgery because of the highly probable chances of complications.

The aim of surgery was to decompress the brainstem by a partial or intracapsular resection of the tumour.

The operation took at least 6 hours (the anaesthetic notes are incomplete) under GA, and at the conclusion the patient remained intubated and returned to the ICU. There was evidence of impaired facial nerve function postoperatively. There was slow improvement but at no stage was there return of full consciousness. A postoperative CT scan demonstrated persisting mid-brain compression with haematoma at the operative site, together with moderate hydrocephalus. Over the next few days he deteriorated and a decision was made to cease treatment.

DISCUSSION

There are several concerns regarding management. In the first place, the fact that the known tumour had not been treated despite being present for at least some years suggests that the risks were always going to be high. The risk of postoperative haemorrhage as in this case is high, and often the degree of decompression of the brain stem turns out to be minimal.

CLINICAL LESSONS

Preoperative and intraoperative decision-making in such cases can be extremely difficult, as seen from this case. The idea that partial or incomplete resections of large acoustic neuromas can be safely performed in high-risk patients is false.

Case 8: A very young patient had an operation likely of marginal benefit

General Surgery

CASE SUMMARY

A 20-year-old woman presented with quite severe chronic abdominal pain. There had been assessment by a number of surgeons and other specialists without a formal diagnosis. The possibility of anorexia nervosa or irritable bowel syndrome had been raised but the operating surgeon was of the opinion that the patient was suffering from median arcuate ligament syndrome (MALS) and possibly superior mesenteric artery syndrome (SMAS), and the patient was offered surgical treatment in a private hospital.

Deciding to treat both conditions required open surgery. If the surgeon had chosen to treat MALS initially, as this was thought to be the more likely cause of the symptoms, it could have been done laparoscopically. Instead, a laparotomy was performed and the median arcuate divided. At the same operation, the superior mesenteric artery (SMA) was transposed and reanastomosed to the infrarenal aorta.

On the fifth postoperative day, the patient developed abdominal distention, nausea and vomiting and was diagnosed with an ileus. Subsequent CT scanning showed obstruction of the junction of the second and third part of her duodenum. The patient returned to theatre where the cause of the obstruction was found to be the mesentery accompanying the SMA. This necessitated taking down the anastomosis and repositioning it elsewhere on the aorta. During this procedure some trauma to the aorta occurred, which also had to be repaired.

Following this second procedure, the high-output small bowel obstruction resolved, and the patient was eventually discharged from hospital. She was, however, readmitted to hospital 3 day later with severe abdominal pain. A CT scan showed that the SMA had occluded and as a result had segmental necrotic small bowel, which required resection. A subsequent second-look laparotomy 2 days later was undertaken, and a further bowel resection was performed. The patient's postoperative recovery was complicated by pneumonia, but she eventually recovered.

Some 3 weeks after the second-look laparotomy, the patient re-presented to the ED with severe back pain, and another CT angiogram demonstrated a false aneurysm arising from the anastomosis of the SMA to the aorta. It also

confirmed the occlusion of the SMA beyond the false aneurysm. After having a major haematemesis, the patient was diagnosed as having an aorto-duodenal fistula. The superior mesenteric artery false aneurysm was initially controlled radiologically with insertion of a covered stent and embolisation of the sac. A further haematemesis, however, necessitated an open surgical approach at which the duodenum was repaired. At this operation the SMA, which had been occluded for some time, was thrombectomised and reanastomosed to the abdominal aorta using an interposition vein graft.

The patient eventually recovered from this operation but 8 weeks later returned to ED with severe back pain and hypovolemic shock. It appears that no consideration of a further aorto-enteric fistula was entertained which, in the assessor's opinion, was an oversight.

Unfortunately the patient had a major haematemesis while being resuscitated and died.

DISCUSSION

The first area of concern is that the surgeon felt that combined treatment of both MALS and SMAS was required, which brings into question the accuracy of their initial diagnosis. Both conditions individually are uncommon to rare. The incidence of them occurring together is rarer still and certainly does not appear in the literature.

A case could have been made for undertaking division of the median arcuate ligament laparoscopically and reassessing the patient's symptoms postoperatively. If they had resolved then, of course, her problem would have resolved. If symptoms persisted then further consideration could have been given to other possible diagnoses and treatments.

The transposition and reanastomosis of the SMA at the initial procedure was the catalyst for a series of worsening complications, and it was directly responsible for the obstruction of the third part of the duodenum. Having then to reoperate on the SMA subsequently led to its occlusion and the small bowel infarction. The small bowel infarction was most likely the source of the nidus of infection that caused the false aneurysm and the aorto-duodenal fistula to develop.

In relation to repair of the aorto-duodenal fistula, there was no indication to resurrect the SMA, especially as the small bowel was viable. Any anastomosis to the aorta is at risk of further infection and pseudoaneurysm formation. This is exactly what transpired.

It would have been preferable to leave the aorta free of any unnecessary anastomoses. Additionally, there was a significant delay in establishing the

diagnosis of a second aorto-duodenal fistula just prior to death although this may not have altered the eventual outcome.

CLINICAL LESSONS

Making abnormal anatomy out of normal anatomy is always fraught with potential complications, and transposition and reanastomosis of the SMA in this case was the catalyst that eventually led to the patient's demise. The assessor does not believe that it was the appropriate operation of choice and therefore it was not in the best interests of this young patient's welfare.

Case 9: Complicated surgery for ovarian malignancy in an elderly arteriopath

General Surgery

CASE SUMMARY

A 91-year-old woman was incidentally found to have a probable right ovarian malignancy on a CT scan that was performed for iliac artery imaging during workup for her aortic valvular stenosis. Ovarian tumour markers were surprisingly normal, and imaging suggested that the tumour was confined to her pelvis. She had significant cardiac and respiratory comorbidities, having undergone a coronary angiogram in the year prior to her diagnosis of ovarian cancer and being on steroids to manage her chronic obstructive pulmonary disease. Her surgical history included deep vein thrombosis following a laparoscopic cholecystectomy and a hysterectomy.

One month following her diagnosis she was admitted to hospital where she underwent a laparotomy and radical debulking of her right ovarian tumour, performed by a gynaecologist. En bloc resection required resection of a portion of small bowel, which was performed by a general surgeon to whom the patient had been introduced immediately prior to surgery. It was documented that this was a 'very difficult' operation, with 1.5 L of blood loss and a 4.5 hour operating time. Repair of a bladder defect following resection of the tumour was performed by the gynaecologist. Histopathology revealed an endometrioid adenocarcinoma.

Following her procedure, the patient was admitted to the ICU on inotropes and subsequently developed a complex pelvic collection with communication between the bladder, rectum, vagina and distal small bowel. This was managed conservatively initially, with several subsequent attempts at percutaneous and transvaginal drainage, but ultimately an attempt was made (by another general surgeon) to salvage the situation with a Hartmann's procedure and ileal conduit for urinary diversion. At the time of surgery, a right ureteric injury was also noted.

During her surgical course, she remained in ICU. Her condition was complicated by paroxysmal atrial fibrillation, prolonged ileus and probable pneumonia. She required prolonged total parenteral nutrition as a response to the rectovaginal fistula. Following her last operation, she required intubation for several days. She subsequently developed congestive cardiac failure and died 7 days after her last procedure.

DISCUSSION

This was a 91-year-old woman with significant cardiac and respiratory comorbidities. While the aim of ovarian cancer surgery is to debulk disease, subsequent management often requires systemic chemotherapy and it seems unlikely that this woman was ever going to reach that point. It was noted that the patient was previously living alone and independently, requiring limited assistance. She had only recently relinquished her driver's license. Given this, major surgery may not seem unwarranted; however, she was clearly a very high operative risk, raising questions as to whether the patient was properly counselled regarding the potential impact of her medical comorbidities. The use of a Risk Assessor Tool, such as the American College of Surgeons' (ACS) Risk Calculator, may have facilitated this process. In this case the ACS Risk Calculator estimated her risk of serious complications at 27%, death at 5% and discharge to a nursing or rehabilitation facility at 36%

Her initial postoperative course was slow, and hints were present that all was not well when she developed postoperative atrial fibrillation after 3 days in ICU. Her white cell count and C-reactive protein remained persistently elevated, which might have prompted earlier imaging being undertaken. Her management seems to have been under the care of a gynaecologist and a general physician, without any general surgical input until it became apparent that all was not well following discovery of gas in her urine, and a CT scan confirmed a complex pelvic collection. General surgical input was sought at that point, but there is no evidence beyond a brief note of any continued general surgical involvement over the next 2 weeks. The failure of the initial general surgeon concerned to be more proactive in this setting is of concern. This is underscored by the decision of the gynaecologist to take the patient back to theatre to attempt to repair the vesico-vaginal part of the fistula complex, something that should never have happened.

It was at this point that further colorectal surgical input was sought, where they were confronted with an unsalvageable situation. Clearly, efforts were made to advocate a palliative approach, but it seems all concerned were dissuaded by the patient and family's wishes. While recognising the primacy of this, there remains a responsibility in these circumstances to be frank with patients when it is apparent that heroic attempts at surgical management are inappropriate or ill-advised.

CLINICAL LESSONS

While the development of a recto-vesical fistula could be considered largely unpredictable, there is a significant question about the appropriateness (or otherwise) of undertaking extensive gynaecological surgery in a 91-year-old woman with known significant arterial and coronary disease. The refusal of the original general surgeon to attend the complications also raises significant concerns about postoperative care and the implications of duty of care.

Case 10: Lack of decisive surgical leadership in a severely cormorbid elderly patient undergoing elective inguinal hernia repair

General Surgery

CASE SUMMARY

A frail 90-year-old man underwent an elective procedure for an allegedly symptomatic right inguinal hernia. He had an extensive list of medical comorbidities including inoperable ischaemic heart disease with associated dilated cardiomyopathy, having sustained 3 separate events of acute myocardial infarction in the preceding 4 years. He attended regular review by his consultant cardiologist, with his cardiac function noted to be declining on serial transthoracic echocardiograms.

He had stage 4 kidney disease (eGFR 22 baseline), atrial flutter managed with oral anticoagulation, type 2 diabetes mellitus and anaemia (attributed to his renal disease) managed with erythropoietin and iron infusions. Preoperative haemoglobin was 118 g/L. He was described as cognitively intact but frail, requiring in-home assistance and a wheelie walker for mobilisation.

This man underwent preoperative review by the attending anaesthetist and his regular cardiologist who deemed him to carry an extremely high perioperative risk of myocardial infarction, pulmonary oedema and stroke. Cessation of anticoagulation (apixaban) 48 hours preoperatively and postoperative care in an ICU was also recommended.

He underwent an elective laparoscopic pre-peritoneal repair of his recurrent right inguinal hernia by a consultant general surgeon in a private metropolitan tertiary hospital, with a concurrent dorsal foreskin slit for paraphimosis performed under the same GA. The indication for this additional component of the procedure was not outlined in the available notes. The entire procedure took approximately 60 minutes.

The patient was admitted as planned to ICU postoperatively. His postoperative haemoglobin was 110 g/L, dropping to 84 g/L 12 hours later. His renal function also deteriorated, with a postoperative eGFR of 18. His regular antihypertensive medications were withheld due to ongoing hypotension (SBP 75 mm Hg). This was treated with intravenous crystalloid and albumin. There were no other acute issues identified by the ICU team.

On postoperative day 3, he was transferred to the ward under the care of the operating surgeon and was also reviewed by his regular cardiologist. Oral

anticoagulation was recommenced. Ward nursing staff reported extensive swelling and bruising of the patient's abdomen and scrotum on arrival. He was reviewed by the operating surgeon on day 4 and noted to be 'exhausted' with observed decline overnight (oxygen saturations recorded as 91–93%). He was reviewed by his cardiologist following an episode of ischaemic chest pain, and glyceryl trinitrate was administered in a coronary care unit. Decision to transfuse was discussed but deferred. Antihypertensives remained withheld.

An emergency response (MET call) was activated on the morning of day 6 when the patient was discovered to be asystolic and unresponsive following an unwitnessed collapse in the bathroom. He was transferred back to ICU with a diagnosis of cardiogenic shock and acute pulmonary oedema. The patient suffered acute coronary ischaemia evidenced by a massive elevation of his serum troponin level. Following discussion with his next of kin and treating cardiologist, he was deemed not for CPR or intubation, although this did not result in advanced resuscitation planning documentation being completed. He was managed with positive pressure oxygen support and IV frusemide. Inotropic support was commenced.

He had a second asystolic arrest later that morning following attempted insertion of a central venous catheter. The previously charted discussion about limitations on care were not enacted and the ICU team again performed CPR, with successful return of spontaneous circulation. The patient was again reviewed by his cardiologist and non-invasive (conservative) care was advised in agreement with ICU. There was no documentation to indicate any involvement of the admitting surgeon at this time.

Despite maximum designated inotrope delivery, the patient remained hypotensive with multi-organ failure and had a further asystolic arrest that evening. He was reported to have died peacefully in the presence of his family.

DISCUSSION

The treating surgeon sought preoperative review from anaesthetic and cardiology colleagues, confirming an extremely high risk of life-threatening or life-ending perioperative complications. There is evidence of a signed consent form; however, this does not detail any discussion regarding the individual risks of this elective operation as they applied to this patient.

The specific symptoms (and their impact on this patient's quality of life) that influenced the decision to operate are not clear from the available documentation. There is no documentation of any episodes of bowel incarceration or obstruction. The operating surgeon's submitted case form states 'repeated presentations with pain' as the indication for surgery. Both First and second line assessor agree that this seems to be a very questionable indication to operate electively on this high-risk patient is accurate.

The choice of operative technique is also questionable here. Given the patient's elevated risk profile, most surgeons with experience in modern hernia management would have performed an open transinguinal repair (consistent with published international guidelines). Laparoscopic pre- peritoneal repair (vs open repair) is associated with a higher incidence of vascular injury and has higher instances of postoperative haematoma formation due to the dead space that results from laparoscopic dissection within the pre-peritoneal space (versus a localised incision). This risk is further increased in an anticoagulated patient.[1] Additionally, in view of his renal impairment, apixaban (oral factor Xa inhibitor) should have been withheld 4 days preoperatively (not 2) to allow for adequate clearance of the drug.[2]

The choice of anaesthesia is typically guided by the anaesthetist; however, an open inguinal hernia repair can be safely and efficiently performed under local or regional anaesthesia, conferring the lowest risk to the patient. It is highly likely that this patient suffered an early postoperative haemorrhage with significant blood loss into the pre-peritoneal space (which while clinically serious can be relatively painless). This is supported by the marked drop in haemoglobin (118 to 83, equating to >20% of his circulating volume) with no evidence of overt fluid volume administration (40 ml/hr for 12 hours) and the substantial abdominal bruising diligently documented (and also photographed) by the ward nursing staff. These are 'red flags' for early postoperative pre-peritoneal haemorrhage.

The decision for blood transfusion was made too late to have made any difference to this man's outcome. While the surgeon flagged the question of transfusion on day 3, ultimately this decision was left to the cardiologist. A request is documented by the ICU junior medical officer for transfusion of 1 unit of packed red cells following readmission to ICU post-arrest (day 6); however, there is no evidence of this being administered. In a patient with severe ischaemic heart disease, the target haemoglobin is typically higher than 83 g/L, though evidence for this is mixed.[3]

It is unclear whether the surgeon was aware of the above issues as there were only 2 postoperative entries in the chart made by the surgeon for the entirety of his 7-day admission, both of which were very brief. Neither mentioned clinical examination of the patient.

The patient's postoperative fluid balance chart (completed in ICU only) suggested a positive fluid excess of >2 L each day. An indwelling bladder catheter was not placed at the time of procedure, preventing accurate fluid balance assessment. This is a critical omission in a patient with known ischaemic cardiomyopathy at high risk of acute pulmonary oedema. It is not clear when or if this man had an indwelling catheter inserted (even on his readmission to ICU).

There was no evidence of any preoperative advanced care planning. An acute resuscitation plan was completed by a junior ICU medical officer following the second asystolic arrest, one of which had occurred after the patient was readmitted to ICU. The medical notes clearly state that a decision was made not to perform CPR; however, the patient still received CPR following his second asystolic arrest, implying miscommunication between ICU staff upon change of shift.

CLINICAL LESSONS

This man died 7 days following a procedure that is commonly performed as day surgery (in more able bodied patients). There were only 2 documented reviews by the surgeon in this time, and the impression is that the surgeon withdrew themselves from active involvement once complications began to arise. A surgeon's role must remain that of taking responsibility, leadership and care coordination for their patients. Decisive surgical leadership in this case would certainly have eliminated several of the apparent treatment decision delays and may well have altered the ultimate outcome.

Part of the role of surgical leadership involves critically evaluating every aspect of a patient and their surgical condition prior to committing to performing an operation. Living with symptoms may be the best available option, and surgeons must not shy away from explaining this to patients and standing by their opinion.

This case demonstrates the need for careful preoperative decision-making and informed consent as well as the importance of clear documentation for complex patients requiring interdisciplinary care. A number of specialists were involved in this man's care, though it is unclear who was leading the decision-making. This patient died as a result of several questionable decisions (and omissions) made by the various treating specialists involved (including the decision to operate at all).

The appreciable risks of elective surgery in an elderly, frail patient with life-limiting comorbidities need to weighed against the perceived benefit of the procedure in terms of impact of the condition on their quality of life and predicted life expectancy. An appropriate discussion between the patient and the surgeon should be well documented to reflect these considerations.

REFERENCES

1. International HerniaSurge Group (2018) International Guidelines for Groin Hernia Management. Hernia 22:1–165.
2. Queensland Department Of Health (2014) Guideline for managing patients on a factor Xa inhibitor. Document# QH-GDL-950:2014-2.
3. Australian National Blood Authority (2012) Patient Blood Management Guidelines.

Case 11: Unnecessary operation on very small, stable aneurysm

Neurosurgery

CASE SUMMARY

A 67-year-old woman with a history of hypertension was admitted to hospital for elective management of an unruptured aneurysm.

The aneurysm was documented to measure 2 mm, arising from the right posterior communicating artery. It was also noted on the imaging that there may have been a 1 mm ophthalmic artery aneurysm. There was no history of subarachnoid haemorrhage.

The patient originally presented a year earlier with transient global amnesia, and the right posterior communicating artery aneurysm was identified as an incidental finding. The patient underwent serial imaging over the following 12 months, and the 2 mm aneurysm was confirmed to be stable.

Despite this stability, it was elected to proceed to intervention. The patient underwent endovascular management of the aneurysm with the use of a flow diverting stent.

Post procedure, the patient was taken to the high dependency unit for further management. The patient was reported to complain of headache and nausea, and then developed vomiting. A repeat CT scan of the brain demonstrated the presence of subarachnoid blood and ventriculomegaly.

Subsequently, an external ventricular drain was placed. Over the next 24 hours, there were some issues with the drain, which required revision, and a further CT scan demonstrated persistent and prominent basal cisterns and subarachnoid haemorrhage.

Repeat CT angiography several days later demonstrated increase in subarachnoid haemorrhage and suspicion of enhancement arising from the right internal carotid artery, distal to the flow diversion stent, suggestive of a bleeding point. This was treated with further endovascular management reinforcing the vessel intraluminally.

Further CT scan the following day demonstrated persistence of subarachnoid blood, particularly in the interpeduncular and prepontine cisterns, and the radiology report suggested that there was some pressure on the brain stem. Therefore, the patient was returned to the operating room three days following

the initial elective procedure and underwent posterior fossa craniectomy and duroplasty. The patient's neurological state continued to deteriorate, and day 7 post initial procedure the patient was declared brain dead.

DISCUSSION

This case demonstrates the most severe of consequences for poor preoperative decision-making. The patient in her seventh decade of life underwent imaging of the brain for an unrelated reason, and a tiny (2 mm) aneurysm was identified. The lesion remained stable on serial imaging. All practicing neurologists and neurosurgeons are patently aware that tiny incidental aneurysms do not require treatment. The risk of treatment far outweighs the minuscule risk of subarachnoid haemorrhage in the patient's lifetime. It can fairly confidently be predicted that in someone of this age, a 2 mm aneurysm will not rupture.

Further, many would argue that there is no such thing as a 2 mm aneurysm in someone of this age, but rather this is an anatomical variation known as an infundibulum. Whether or not this was an infundibulum or an aneurysm, there was absolutely no indication to treat.

Given that treatment proceeded, it is a cautionary reminder to all that endovascular surgery is not without significant risk, and in this case there was perforation of the internal carotid artery distal to the stent, which resulted in significant subarachnoid haemorrhage, hydrocephalus and ultimately death.

One must also question the decision to treat the subarachnoid basal cisternal blood via a suboccipital craniectomy. There is no good supporting literature published that suggests that this is the appropriate course of action, and it is more likely than not that this was undertaken for want of doing something, rather than being seen to do nothing, given the drastic and disastrous consequences of the endovascular treatment for a condition that did not require intervention in the first place.

CLINICAL LESSONS

It is imperative that all neurosurgeons carefully consider the clinical indications regarding treatment of any lesion and understand and fully appreciate that complications do occur. When complications do occur in the setting of a procedure that was not ever indicated, the dire consequences are much harder to live with.

Case 12: Up-to-date imaging before operating for renal tract stone disease may prevent unnecessary surgery

Urology

CASE SUMMARY

This is a case of an 86-year-old female nursing home patient with diabetes, atrial fibrillation, superior mesenteric artery stenosis, stroke and chronic kidney disease, who was admitted for elective ureteropyeloscopy and stone fragmentation. This was following an initial presentation 5 months earlier with a pelvi-ureteric junction stone causing urosepsis, which was managed by nephrostomy and antegrade stent insertion.

At the time of the elective procedure, the stone was not found. In the hours after surgery, the patient became hypotensive and she was transferred to the ICU. Ischaemic bowel was suspected but, as it was determined the outcome would be poor regardless of intervention, the family agreed to palliate, and she died 14 hours post procedure.

DISCUSSION

The case notes are adequate, but there is no record of preoperative assessment. For this reason, it is not possible to determine the answer to the first-line assessor's question about whether preoperative urine culture was done. There is no record of perioperative antibiotic administration, but the patient was on long-term Bactrim. With regard to the details of the procedure itself, the case notes are sufficient and indicate no areas of consideration or concern.

As the audit team acknowledges, a CT scan should have been performed closer to the date of surgery. This would have assisted in locating the stone, confirming stone size and assessing for stent encrustation. As it turns out, the stone was not seen intraoperatively. Had a more current CT been done, it is possible the procedure would not have gone ahead, and the patient would simply have had the stent removed under local anaesthetic.

There is no record of preoperative urine culture. In a patient whose initial presentation was with urinary tract infection, and who was on long-term antibiotics, this should have been done in order to determine appropriate perioperative antibiotic prophylaxis.

There is no record of administration of perioperative antibiotic prophylaxis. As the

first-line assessor has pointed out, it is possible that sepsis-induced hypotension contributed to the patient's deterioration and, had perioperative antibiotic therapy been given, it could have altered the postoperative course.

CLINICAL LESSONS

The decision to operate at all is an area for consideration. Before surgery, consideration could have been given to regular stent changes or expectant management, but it is not possible to determine from the notes if these conversations were had. It is entirely foreseeable that, had such discussions proceeded, the patient would still have continued to surgery given that she had a urinary tract stone that had already caused sepsis.

Patients undergoing stone surgery should have preoperative imaging done as close to the procedure date as is possible.

Preoperative urine culture should be done on all patients undergoing endoscopic urologic surgery who have a recent history of urinary tract infection.

Appropriate perioperative antibiotic prophylaxis should be administered to all patients undergoing endoscopic procedures of the upper urinary tract.

Elective surgery in patients at considerable risk of death from intervention should have alternative management strategies discussed within the treating unit and with relevant decision-makers.

Case 13: Transfer for futile surgery not appropriate

General Surgery

CASE SUMMARY

A 74-year-old woman was admitted with coffee ground haematemesis and peritonism at triage category 2 to a large regional hospital with surgical capabilities. She had been assessed in the ED the day before with vomiting and diarrhoea and discharged with a diagnosis of gastroenteritis.

There was a significant history of atrial fibrillation, cardiomegaly, hypothyroidism, diverticulosis and chronic bronchitis. Her medication included metoprolol, dabigatran and Furosemide. A CT scan showed a severely fluid-filled small bowel extending to the stomach and oesophagus with a vortex-like twist in the superior venous confluence.

Upon review of the abdominal scan and prior to a nasogastric tube (NGT) being placed, a CT of the chest was requested to rule out oesophageal perforation, the reasoning for which is difficult to fathom. It simply showed a grossly fluid-filled oesophagus. Following the CT, the patient's respiratory status deteriorated with a suspected aspiration.

The nursing notes state the surgical team were heavily involved throughout (first recorded at 15:20) but the first surgical documentation is 20:00, simply stating the patient improved with NGT drainage. At 21:30, consultant surgical and anaesthetic review occurred, documenting a small bowel obstruction due to a volvulus and closed loop obstruction. There were significant issues of congestive cardiac failure and atrial fibrillation, aspiration pneumonia and a rising lactate of 4.3. They felt the patient was a high anaesthetic risk and had deteriorated significantly in 2 hours.

After discussion with the family, it was felt the patient should be transferred to a tertiary facility for surgery via Royal Flying Doctor Service as a priority 1 transfer for optimisation and ICU management. Transfer occurred at 23:30, and the patient arrived in the receiving hospital at 01:55 the following day in a pre-arrest situation. Resuscitation occurred and at 04:30, a laparotomy was undertaken and extensive small bowel necrosis was discovered. The operation was aborted and the patient was closed and palliated, dying at 11:46.

DISCUSSION

It may simply be hindsight, but this patient was unwell because of a surgical emergency. She was not going to improve with any amount of optimisation until the compromised small bowel was dealt with. The assessment that ICU would be required postoperatively was almost certainly correct, but intubation, inotropes and management of a compromised postsurgical patient should be within the capabilities of any centre performing surgery. Ongoing ventilation may be required in theatre until the transfer could occur, if not in the ED or ICU.

There appears to have been no discussion between the two hospitals at a consultant level, either by the surgical team or anaesthetic team to discuss this approach. There was no discussion around potentially futile care or palliation with the family present. If a well-documented discussion between the two surgical and anaesthetic teams had occurred where the need for urgent intervention was acknowledged along with the likely delay of 4 hours for transfer, then a different approach may have been considered.

It is questionable as to whether this patient would have survived surgical intervention at either location, in which case the need to transfer and operate at all should have been discussed. The expected National Emergency Laparotomy Audit Score on admission was above 30 and by the time of arrival at the tertiary centre was over 60 (physiological and operative severity score for the enumeration of mortality and morbidity predicted 99%). An appropriate conversation between the family and treating teams does not appear to have occurred.

Again, in hindsight, ideally this patient should have been informed that without immediate surgery, they would almost certainly die. That with surgery, there was a still very high chance of this and been given the option. Surgery, if it was to be performed, should have been at the regional centre after a discussion with the tertiary centre to explain that ICU would be required postoperatively. If it was determined to be futile, then it should have been abandoned locally.

How the family would have viewed the regional hospital if they felt their mother died without 'everything being done' is different entirely. Would the tertiary hospital anaesthetists have been supportive of their colleague if the patient had arrested under a risky GA? If clear and open communication had occurred and been documented between the patient, family and medical staff at both institutions, all of these questions may have been covered and the appropriate decision could have been reached for this patient.

CLINICAL LESSONS

There is overwhelming evidence that if a laparotomy is required, any delay is detrimental. There is also a large volume of work on futile surgery and the need for surgeons to be prepared to make this call and, if necessary, seek collegiate advice.

Abbreviations

AF	atrial fibrillation
AS	aortic stenosis
BAV	balloon aortic valvuloplasty
BP	blood pressure
CABG	coronary artery bypass graft
CPR	cardiopulmonary resuscitation
CT	computed tomography
ED	emergency department
GA	general anaesthetic
ICU	intensive care unit
IV	intravenous
MALS	median arcuate ligament syndrome
MET	medical emergency team
MRCP	magnetic resonance cholangiopancreatography
MRI	magnetic resonance imaging
NGT	nasogastric tube
PET	positron emission tomography
SIRS	systemic inflammatory response syndrome
SMAS	superior mesenteric artery syndrome
TAMIS	transanal minimally invasive surgery
TAVI	transcatheter aortic valve implantation

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