

Victorian Audit of Surgical Mortality



Case Note Review Booklet

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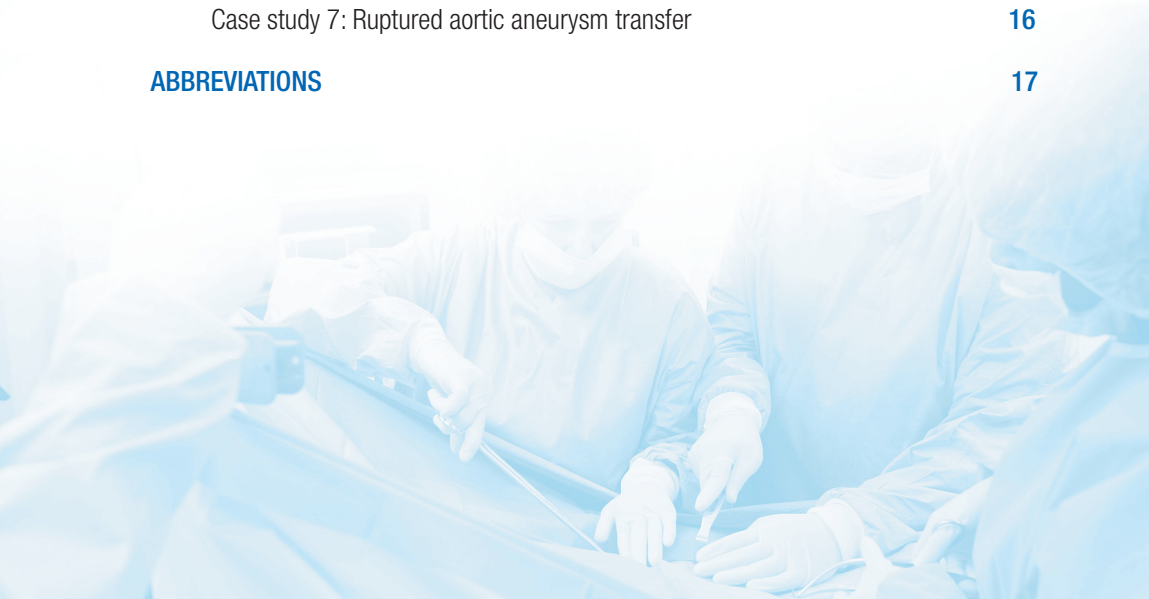


Royal Australasian College of Surgeons



Contents

INTRODUCTION	3
GENERAL SURGERY	7
Case study 1: Stomal necrosis	7
Case study 2: Multiple organ failure	9
Case study 3: Anastomotic leak following stoma	10
NEUROSURGERY	12
Case study 4: Craniotomy and evacuation of Epidural Hemorrhage/ Hematoma (EDH)	12
ORTHOPAEDIC SURGERY	13
Case study 5: Revision left total knee replacement - Laparotomy/ bowel resection/femoral herniorrhaphy	13
PLASTIC SURGERY	15
Case study 6: Split skin graft to left leg	15
VASCULAR SURGERY	16
Case study 7: Ruptured aortic aneurysm transfer	16
ABBREVIATIONS	17





Introduction

The Victorian Audit of Surgical Mortality (VASM) audits deaths that occur whilst under the care of a surgeon. As this peer review process is intended as an educational exercise, we have selected a number of cases that bring out specific clinical issues that we feel should be highlighted.

All cases selected have gone through a second-line assessment (case note review) by a Fellow of the Royal Australasian College of Surgeons. It is the excellent quality of these assessments that allows us to produce this review.

We take this opportunity to thank all surgeons participating in VASM. We hope you find this publication of value.

The assessors have raised a number of important issues:

Case study 1

Leadership in the patient care process: while the benefits of multidisciplinary input to patient care are well proven, a senior clinician should be actively coordinating and supervising all phases of that care. In this case coordination and supervision from the treating surgeon appears to have been lacking. Dieticians increased enteral nutrition in a patient with small bowel obstruction. The unresolving small bowel obstruction and sepsis was not recognised despite strong evidence on CT scan.

The assessor felt the outcome for this patient may have been different with better coordinated clinical management.

Comment: When there is input from a variety of disciplines, overall accountability for care should be established and confirmed at the outset, and processes developed for team discussions at regular intervals.

Case study 2

The clinical picture of abdominal pain, anorexia, sepsis on a background of known vascular disease and an episode of atrial fibrillation requires that gut ischaemia be considered as a cause or consequence. Laparoscopy or laparotomy may have been indicated in this patient.

The assessor acknowledges that, given the severity of established multi-organ failure, surgery would probably not have altered the outcome.

Comment: A postmortem would have been useful to establish the true diagnosis.



Case study 3

Informed consent has a dual purpose. Firstly, it informs the patient of probable diagnosis, and the treatment options and their consequences. Secondly, the patient can be given more information on issues they don't understand. In this case the full consequence of refusing a stoma may not have been appreciated. From a surgical perspective the process of gaining consent provides valuable insight into the patient's wishes and expectations. The latter may need to be realigned with known outcomes to avoid inappropriate expectations.

With such a major case with high potential for adverse outcome, the treating surgeon should be responsible for the consent process. Having to adopt a suboptimal treatment plan would have been an unpleasant experience for any surgeon. We must accept that in this instance the patient had the absolute right to expect their wishes to be observed. However, if the consequences had been fully outlined would the same decision have been made? The communication breach between registrar and surgeon must surely have been a learning process for both.

Comment: Could the operation have been delayed to allow for further discussion with the patient? However, this would indeed have been a difficult option considering the circumstances. The lesson here for consultants, registrars and others is the importance of timely discussion of consent with patients and ensuring all implications are considered prior to surgery.

Case study 4

As regards the surgical management, it appears that the general surgeon performed very competently, dealing adequately with the haematoma. Unfortunately, the patient's condition prior to transfer was so serious that a poor outcome was expected at the time of that surgery.

Unfortunately, we could not gain access to useful reports from the first or the second hospital to allow us to be fully confident about all aspects of surgical management.

Comment: It is difficult to make a judgement when the information is incomplete. This case highlights the importance of keeping an accurate record, which is the key to understanding the issues involved.



Case study 5

This case exemplifies the need to establish a proper diagnosis for persistent symptoms. An orthopaedic patient in a rehabilitation unit developed an acute but unrecognised surgically correctable problem. This occurred as the treating doctors did not consider the possible causes of the persistent symptoms of vomiting and examine the patient with those in mind.

After the cause was eventually identified and then confirmed by appropriate investigation, there seems to have been a delay in obtaining surgical input at a senior level. Requests for cross speciality review all too often seem to go through junior medical staff and filter upwards (or not). This is inefficient and unreliable. Surely it would be better if such requests were made directly between appropriate senior medical staff.

Comment: This case highlights the problems with specialised and fragmented care, where patient problems outside the comfort zone of one speciality are not considered and inappropriate diagnoses are entertained for too long. This case also demonstrates the issue which occurs too frequently of failure to recognise early clinical deterioration in a patient.

Case study 6

In this case, an elderly patient with complex medical problems presented with a relatively straightforward and reversible surgical problem. The surgical issue was addressed appropriately but the complex medical problems were allowed to deteriorate without early intervention by those best able to manage them.

In this case it appears that the injury, but not the patient, received optimal care.

Comment: Again this case demonstrates a failure to recognise clinical deterioration in a patient. Just because a patient presents with a surgical problem, it does not mean this is his or her only or most significant problem.





Case study 7

The reviewers saw the outcome as potentially avoidable, especially the delay in clinical diagnosis, lack of communication with a vascular surgeon, and lack of timely transfer of the patient (or the vascular surgical team). The eventual air transfer of a patient who had no chance of survival was also avoidable by first telephoning the surgeon.

Comment: Important lessons should be remembered. Physically examine the painful abdomen, diagnose before giving morphine, accept low blood pressure with abdominal tamponade until the aorta can be clamped, then resuscitate.

Overall recommendations

- In complex cases, there needs to be clear demonstrable leadership in patient management. Regular team meetings involving all disciplines are needed to ensure the treatment plan is understood by all.
- When the cause of death is not obvious, a post-mortem can provide the diagnosis.
- The case record has to contain good, accurate documentation that is made available to all treating doctors.
- When clinical deterioration occurs in a patient and there is no clear cause, remember the cause may be related to something outside your speciality knowledge base.





Case study 1: Stomal necrosis

Summary

Following a colonoscopic perforation just proximal to a stenosing rectal carcinoma, an elderly patient was transferred to a metropolitan hospital. At laparotomy the rectal cancer was left in situ, the distal bowel over sewn and a drain tube placed into the pelvis. After one night in the Critical Care Unit (CCU), the patient was discharged to the ward.

A few days later, the Intensive Care Unit (ICU) liaison service recommended removal of the central venous (CVC) and indwelling catheters as the patient was still febrile. At this time the output from the stoma remained minimal and due to concerns about the viability of the stoma, the patient returned to the operating room for refashioning via a local approach.

The following day, surgical review requested sips of fluid only until the stoma was functioning. *Endone* was required for abdominal pain. That evening a Medical Emergency Team (MET) call was precipitated by increasing confusion and respiratory distress. The patient was intubated and returned to ICU. A nasogastric (NG) tube was inserted with minimal return. Ongoing fever, abdominal distension and minimal stomal output were again noted.

Abdominal and chest x-rays were performed but the report makes no mention of the state of the bowel. Abdominal distension with no significant stoma output is recorded. The surgical team are recorded as being unconcerned at this stage.

Despite the mention of an ileus and the possibility that vomiting had caused the respiratory problem, the MET call and return to ICU, there is a recommendation to increase the enteral feeding until a nutritional target had been achieved. From the fluid balance chart to this point there had been minimal oral intake and nothing from the stoma. Subsequently, close to a litre of *Osmolite* was given via the NG tube. The stoma remained non-functioning.

A trial of enteral feeding with a 'tiger tube' was then implemented. The nursing note that evening stated that enteral feeding was continuing and that there had been no output from the stoma. The tiger tube was noted to be curled in the pharynx and had to be repositioned. Feeds were stopped at this point to await an abdominal computed tomography (CT) scan. However, once regarded as safe, feeds were to continue.



The critical part of the CT scan report indicates multiple distended fluid-filled small bowel loops with air fluid levels throughout its length to the ileocaecal junction. The colon to the stoma was decompressed. The surgical registrar reviewed the result and concluded that the picture represented an ileus and suggested recommencing parenteral nutrition.

NG drainage continued but halfway through the second week the stoma began to function. The patient developed signs of sepsis with a raised temperature and high white cell . Stoma output was reported as low, but the patient was felt to be improving and nasoenteral feeds were recommenced. High volume aspirates, distended abdomen and low stomal output continued. The enteral feeds were reduced. A further CT was preformed but this report was not available to the reviewer.

A decision to perform a laparotomy was taken. The findings were small bowel obstruction with perforation in the right iliac fossa and faecal peritonitis. A small bowel resection with a second proximal stoma, and drainage of infected pelvic hematoma were performed. Palliative care followed.

Reviewer's comments

There did not appear to be a single clinician managing the surgical aspects of the patient. The consequence was the small bowel obstruction was not recognised, even after a CT scan confidently made the diagnosis. It was only the laparotomy which confirmed the obstruction and faecal peritonitis.

Control of fluid intake also appeared to lack coordination, with the dietician seemingly intent in increasing enteral feed supported by the intensivists, despite no evidence of gut motility and the suggestion of obstruction or ileus.

The lack of an overall coordinated clinical management plan contributed to this patient's death, which was probably avoidable.



Case Study 2: Multiple-organ failure

Summary

A middle aged patient presented to a rural hospital with a brief history of abdominal pain, vomiting, anorexia and lethargy, and becoming increasingly unresponsive. The patient described palpitations the week prior to admission but no chest pain or shortness of breath. In the hospital a narrow, complex, tachycardia was noted, with a rate around 200 beats per minute and no recordable blood pressure. *Verapamil* was given with some effect before transfer to a larger centre on an adrenalin infusion. This episode occurred on a background of chronic obstructive airways disease, ischemic heart disease and a past history of a right carotid endarterectomy.

On transfer to a larger hospital the patient was described as being in septic shock, with a tender abdomen and lactic acidosis. Examination suggested a generally tender but soft abdomen with no apparent guarding or rigidity in this obese patient. The only other positive feature was bilateral crepitations on chest examination.

A CT abdomen performed that day was interpreted as showing a fatty liver, cholelithiasis but no clear cause for the current state. The pancreas was noted to be normal. The white cell count, lactic acid and C-reactive protein (CRP) were elevated. Liver function tests (AST and ALT) were markedly elevated.

The surgical registrar suggested sepsis could be due to ischemic hepatitis, urinary source or viral illness. The patient was discussed with the consultant who agreed there was no clear, surgically correctable, abdominal cause. Regular reviews by the surgical registrar that night in intensive care describe a stable patient on noradrenaline and maintaining oxygen saturation with low concentrations of inspired oxygen on a Hudson mask. Atrial fibrillation (AF) with a rate <150 is recorded. At some point that night the patient required intubation.

The ICU registrar recorded generalised rebound abdominal tenderness to deep palpation but no rigidity. The CT was reviewed and a trace of ascites and subcutaneous emphysema were described. The patient next developed multi-organ failure. No clear septic source was identified and broad spectrum antibiotics were continued. Acute myocardial infarct then occurred with severe impairment of left ventricular function and mitral regurgitation. Acute liver failure, coagulopathy oliguric renal failure requiring haemofiltration is recorded. A repeat CT scan several days after admission was apparently normal.



Reviewer's comments

This patient died of septicaemia of unknown origin. Given the history of abdominal pain, atrial fibrillation and the known vascular disease, the diagnosis of ischemic bowel had to be considered. This diagnosis is not definitively excluded by CT scan. A laparotomy or even laparoscopy on admission to the tertiary centre may have been indicated in this patient.

It is acknowledged, however, that, given the severity of the established multi-organ failure, surgery would probably not have changed the outcome.

Case 3: Anastomotic leak following stoma

Summary

A frail, elderly patient with known respiratory and cardiac problems presented with small bowel obstruction. Anaesthetic risk assessment confirmed a high risk for surgery. After some time a decision to proceed to surgery was made. During the surgeon's discussion with patient and family regarding the need for surgery, the patient made it clear they did not want to be resuscitated in the event of cardiorespiratory arrest.

Just prior to administration of anaesthesia, the registrar informed the surgeon that the patient had indicated they did not, under any circumstances, want a stoma. This refusal of a stoma had not been conveyed to the surgeon during the earlier discussion with patient and family. A decision to proceed with the surgery was made.

At laparotomy, a torted ascending colon with a patch of necrosis and extensive small bowel adhesions were found. Extensive adhesiolysis was necessary to mobilise the ascending colon for a right hemicolectomy, resulting in several serosal tears which were oversewn. A sinus tachycardia and hypotension occurred during the procedure. Because of the patient's refusal of a stoma, the simpler and safer option of then removing the ascending colon and simply 'bringing out the ends' was not available. A right hemicolectomy with side-to-side anastomosis was performed.

The patient required inotropes and ventilatory support postoperatively, but made good progress for the first few days. Patient was weaned off inotropes and extubated, but then began to deteriorate. At this point faeculent fluid from the midline incision was noted, consistent with anastomotic leak or leakage from damaged small bowel. Treatment was withdrawn at request of patient and family and the patient died.



Overall, the management of this case appears to have adhered to a reasonable care pathway. There appear to be no grounds for concern about the initial conservative management, the decision to operate and its timing, the quality and skill of the surgery or the postoperative management.

Reviewer's comments

An adverse event in the form of an anastomotic leak has occurred. The risk of leakage, either from the surgical anastomosis or from damaged small bowel, in a frail, elderly patient with significant comorbidities undergoing this sort of surgery after nearly a week of obstruction, with necrotic bowel present, is very substantial. Once such leakage occurs, a fatal outcome is probably inevitable, even if the family had not ultimately refused further active treatment.

It is reasonable, therefore, to suggest this case is one where the outcome was not preventable. The case does, however, raise one interesting area for consideration in relation to informed consent, or in this case informed limitation of consent - that is, the patient's refusal to allow a stoma 'under any circumstances'. This is a very serious limitation of the surgeon's options. Simple exteriorisation of the bowel ends might have led to a different outcome. The patient has an absolute right to refuse any aspect of treatment, or all treatment, but as surgeons we have a responsibility to ensure that this is a fully informed decision. We do not know the seniority of the registrar in this case, nor the mental capacity of the patient, or when and under what circumstances the consent was revised. Nobody wants a stoma, but in many patients the fear of such is quite uninformed. Most patients will accept the necessity, if the nature and management of stomas, and, in many cases, their temporary nature, is fully explained. We do not know if this was done, or if the registrar had sufficient experience to do so and to realise what a serious limitation this constituted.

The patient's decision should have been conveyed to the consultant well before surgery commenced, so the consultant could have the opportunity to discuss that specific limitation again with the patient and family and could be satisfied that it was an informed, reasonable and final decision. There appears to have been a significant failure of communication in this instance.



Case Study 4: Craniotomy and evacuation of epidural haemorrhage/haematoma (EDH)

Summary

This patient's management extended over three hospitals in quite rapid succession. We have been provided with the records of the third hospital and some ambulance transfer notes which give the general sequence of events, but details of management at the first and second hospitals are not clear. The facts of the case are outlined in the case record form and confirmed by the first-line assessor. The available hospital records clearly support the conclusions of both these documents.

A young patient presented to the emergency department (ED) after an assault involving a blow to the side of the head. The patient was described as agitated and complaining of headache. Analgesics and sedatives were prescribed. Some hours later the patient was found to be deeply unconscious with fixed dilated pupils. The patient was intubated and transferred to a second hospital where a CT scan demonstrated a large extradural haematoma. The on call general surgeon evacuated the haematoma and took out two bone flaps which were inserted into the subcutaneous tissues of the abdomen. Apparently there was bleeding from the right middle meningeal artery which was diathermied and sutured. Subsequently the patient was transferred to ICU in a third hospital, presumably under the care of a neurosurgeon. A repeat CT demonstrated adequate evacuation of the haematoma but other major secondary changes were noted. As the clinical state remained poor with clinical features of brain death, treatment was withdrawn after appropriate discussion with the family.

Reviewer's comments

One gains the impression that the initial management in the first hospital may have been suboptimal leading to significant deterioration in conscious state. One wonders what neurological observations were performed. Unfortunately we do not have the records from that hospital and cannot comment further.

As regards the surgical management, it appears that the general surgeon performed very competently, dealing adequately with the haematoma. Unfortunately, the patient's condition prior to transfer to that second hospital was so serious that a poor outcome was expected at the time of that surgery. Unfortunately, I do not have access to any documentation from the first or second hospitals in order to be fully confident about all aspects of surgical management.

This case also demonstrates a problem VASM faces when multiple hospitals are involved in the care of a patient. Despite numerous requests VASM was unable to gain access to the relevant case records from the initial treating hospital.



Case 5: Revision left total knee replacement - Laparotomy/bowel resection/femoral herniorrhaphy

Summary

An elderly person with mild comorbidity (hypertension and gastro-oesophageal reflux) was admitted for a total knee replacement. The patient was transferred to rehabilitation unit after an uneventful surgery. Subsequent to transfer the patient had episodes of nausea and vomiting. The intern notes indicate no abdominal examination was performed and no cause was suggested. Over the next week the nausea and vomiting persisted. Occasional watery diarrhoea was noted and an infective cause was suggested. A fluid balance chart does not seem to have been kept over this time. A case note entry stated that suprapubic tenderness was present. Treatment centred around anti-emetics, oral and intravenous (IV) fluids. Gastro-enteritis, side-effects of opiate analgesia or postoperative ileus, were listed as possible causes for persisting symptoms.

An abdominal x-ray done after a further period demonstrated distended bowel loops and this prompted a surgical referral. When a general surgical registrar reviewed the patient several days later and diagnosed an obstructed left femoral hernia, the patient was tachycardic and hypotensive.

At laparotomy, a strangulated left femoral hernia with perforated small bowel and extensive peritoneal soiling was found. In addition to repair of the femoral canal, a small bowel resection with end to end anastomosis and extensive abdominal lavage was performed.

Postoperative care was provided in intensive care. The day after the laparotomy, spreading abdominal cellulitis led to the wound being opened with discharge of haemoserous fluid with odour. The surgical team was informed and felt that further surgical intervention would be of no benefit.

Over the next few days the patient become more acidotic with increasing inotrope requirements and required haemofiltration. Death subsequently occurred.





Reviewer's comments

The care provided by the medical rehabilitation unit (MRU) appears to have been inadequate, firstly in respect of fluid and electrolyte management, and secondly by failure to establish a cause for the ongoing vomiting, abdominal distension and constipation.

The failure to involve a more senior surgeon in the assessment of the patient is worth noting. This led to a delay in the investigation for a possible surgical cause.

The outcome in this patient could have potentially been avoided if an appropriate and timely surgical referral had been made. The patient was in a rehabilitation unit for one week with anorexia, nausea, persistent vomiting, minimal bowel action and abdominal distension, without establishing a diagnosis. Postoperative ileus is an unusual complication of knee replacement and other surgically-related causes should have been considered.

The case notes are deficient, with no documentation of medical history and physical examination on the day of admission. The initial assessments appear to have been done by very junior staff. Appropriate investigations (e.g. CT scan) towards a diagnosis were not ordered. Fluid balance was not recorded in a patient described as having daily vomiting and poor intake.

Subsequent management in terms of surgical intervention and postoperative resuscitation in the ICU were appropriate, but there is a real likelihood that the outcome would have been different had the diagnosis been made earlier.





Case 6: Split skin graft to left leg

Summary

An elderly patient presented with a laceration of the leg requiring skin graft.

There was significant past history, not all available at admission, of alcoholic liver disease with varices, malaena, venous insufficiency, cardiomyopathy and chronic hyponatremia. There was a significant delay before admission and routine grafting, although there is no specific evidence this delay caused problems. Shortly after surgery, the patient's legs and arms were noted to be oedematous with skin breakdown and ooze into the bed. Review by the plastic surgeons a week after surgery described complete skin graft take. A request for medical review was made at this time. The medical unit commenced albumin and Lasix. The patient began to mobilise and was being prepared for discharge.

Prior to discharge the patient began to deteriorate with confusion and anaemia. A bleed into the buttock led to investigations indicating the presence of a coagulopathy requiring correction. Blood, transfusions and eventually embolisation were necessary to control the bleeding vessel. There was progressive multiple-organ failure, ongoing bleeding and subsequent demise after withdrawal of active management.

Reviewer's comments

Thorough history taking and documentation of comorbidity is essential on admission. Early management and investigation of adverse changes such as oedema and falling haemoglobin is important.

The hospital record is reasonably thorough, though a few points are worth noting. A clear elucidation of the past history was not made until the final summary by the ICU. At this time, the cardiomyopathy and chronic hyponatremia were first documented. This is important as these may well have contributed to the multiple-organ failure.

The delay between admission and grafting probably did not contribute to the eventual outcome.

Despite significant and generalised oedema, medical review was not obtained for a significant period. The past history of cardiomyopathy was not elucidated at an appropriate stage of management.

The progressive fall in haemoglobin noted over the days prior to collapse was not investigated nor was consideration evidently given to ceasing anticoagulation until this collapse occurred. This was a preventable death, given the underlying chronic disease pattern.



Case 7: Ruptured aortic aneurysm transfer

Summary

This previously fit elderly person suffered sudden abdominal and back pain, possibly renal in origin. After several hours in the emergency department with worsening hypotension, cardiac arrest occurred. A CT scan had just diagnosed a ruptured aortic aneurysm. Resuscitation was attempted repeatedly for an extended period, but hypotension was unresponsive to high volume blood transfusion. Air ambulance transfer was made to ICU at a second hospital, where an intensivist and surgeon determined the patient was brain dead and resuscitation ceased.

Reviewer's comments

The first hospital's diagnosis was made by CT scan after some time, with no recorded medical examination. Morphine was given, predictably reducing the tamponading effect of the abdominal muscles, and cardiac arrest followed. Instead, within these few hours, transfer to the second hospital could have been achieved, leaving the blood pressure at 80 mm to minimise bleeding.

After prolonged cardiac arrest and transfusions without response, the transfer to the second hospital's ICU for intensivist and surgical opinion was fruitless.

Once again, important lessons stand out: physically examine the painful abdomen, diagnose before giving morphine, accept low blood pressure with abdominal tamponade until the bleeding aorta can be clamped, then resuscitate. If the first hospital is not equipped to control the aorta, discuss the patient's survivability with an available vascular surgeon and decide whether to transfer the patient, or import the surgical team, or palliate.

The reviewers saw the outcome as potentially avoidable, especially the delay in clinical diagnosis, lack of communication with a vascular surgeon, and lack of timely transfer of the patient (or the vascular surgical team). The eventual air transfer of a patient who had no chance of survival was also avoidable by first telephoning the surgeon.





Abbreviations

AF	atrial fibrillation
ALT	alanine amino aransferase
AST	aspartate amino transferase
CT	computed tomography
CCU	critical care unit
CRP	C-reactive protein
CVC	central venous catheter
ED	emergency department
EDH	epidural haemorrhage/haematoma
HMO	honorary medical officer
ICU	intensive care unit
IV	intravenous
MET	medical emergency team
MRU	medical rehabilitation unit
NG	nasogastric
RMO	resident medical officer
VASM	Victorian Audit of Surgical Mortality





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The information contained in this Case Note Review Booklet has been prepared by the Royal Australasian College of Surgeons Victorian Audit of Surgical Mortality Management Committee, which is a declared quality improvement activity. The Australian and New Zealand Audit of Surgical Mortality, including the Victorian Audit of Surgical Mortality, also has protection under the Commonwealth Qualified Privilege Scheme under Part VC of the Health Insurance Act 1973 (Gazetted 6 November 2006).