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COLLEGE OF SURGEONS

QASM

Queensland Audit of Surgical Mortality



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LESSONS from the AUDIT VOLUME 7



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Introduction

The Queensland and Northern Territory Audits of Surgical Mortality (QASM and NTASM) have been reviewing and assessing cases in 2011. Your *Lessons from the Audit (Volume 7)* looks at cases where significant issues arose. It is from these cases we can learn many reasonable lessons.

The audits are covered by Qualified Privilege (QP) which protects all Fellows while allowing publication of de-identified data. QP is non-compromising and will always be reassuring to surgeons. We learn lessons from the past. This will, without question, improve our surgery in the future.

This volume of lessons was interesting to review. It looks at issues of communication, documentation, road trauma, and systems failures. It looks at the simple hernia and the ruptured aneurysm. Importantly, however, it looks at eight patients with unique issues and outlines the treatment they received or, in some circumstances, the treatment they did not receive.

As surgeons, we are care-givers and need to remember that decision-making is probably the most important part of our surgical practice. One lesson, *Decision before incision* (see page 15), highlights this issue.

As colleagues, I want to thank you for your faithfulness in returning surgical case forms and assisting me in first-line and second-line assessments.

There are many excellent tools that we have in our continuing professional development program (CPD) but some require more input than others. **I would remind you that for RACS CPD compliance, participation in the audit process is compulsory. Your credentialing demands this compliance.**

A recent lecture by the Honourable Geoffrey Davies AO, at the Queensland RACS Annual Scientific Meeting, reminded us that the public perception of surgeons has fallen substantially in recent years due to a range of issues. It is this public perception that needs rebuilding by an appropriate, open, and comprehensive audit of all our processes.

John North
Clinical Director

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'A man will be commended according to his wisdom...'

Proverbs 12:8 NKJV 1997®

Abbreviations

AKA	above-knee amputation
ANZASM	Australian and New Zealand Audit of Surgical Mortality
BAKA	below-knee amputation
BiPAP	bi-level positive airway pressure
CABG	coronary artery bypass graft
CPR	cardiopulmonary resuscitation
CRF	chronic renal failure
CT	computed tomography
ECG	electrocardiogram
ED	emergency department
GCS	Glasgow Coma Scale
GP	general practitioner
ICP	intracranial pressure
ICU	intensive care unit
IV	intravenous
LFTs	liver function tests
NTASM	Northern Territory Audit of Surgical Mortality
QASM	Queensland Audit of Surgical Mortality
RMO	resident medical officer
RUQ	right upper quadrant
TPN	total parenteral nutrition
WCC	white cell count

(1) Good communication - good investment?

An elderly patient with multiple co-morbidities was diagnosed with adhesive small bowel obstruction based on clinical history and radiological findings. The patient also had a history of multiple abdominal operations.

The patient was initially treated conservatively and started passing flatus after several days. Symptoms recurred and after a week of non-operative management, the treatment was declared unsuccessful.

After consultation with anaesthetists and ICU physicians, TPN was started. It was felt that the patient was not a potential candidate for post-operative ICU care.

Pre-operatively, limited discussions had been held with close relatives regarding end-of-life issues.

The patient was taken to theatre and a laparotomy revealed extensive and dense adhesions throughout the abdominal cavity. Lysis of adhesions was performed from duodenojejunal flexure to the ileocaecal junction. A tight stricture was also encountered in the distal ileum.

A simple side-to-side anastomosis was performed, bypassing the stricture. There were no iatrogenic enterotomies during this extensive procedure. At the end of

the procedure, a warm saline washout was performed.

The patient's post-operative course was unremarkable and TPN was continued.

After nearly a week, the patient's temperature spiked and a chest X-ray suggested acute pneumonia. The following day, right iliac fossa and abdominal pain began but the abdomen was not distended. A CT scan revealed large bilateral pleural effusions, and lower lobe loss of volume suggested a pneumonic process. No free air was present in the intra-peritoneal space but multiple small bowel loops were noted in the pelvis.

Although the issue of anastomotic leak was raised, there did not appear to be support for this. Medical consultation was sought for the acute pneumonia and discussions with the family were again undertaken. No further invasive treatment was requested and the palliative care team was consulted to continue the patient's care. The patient passed away nearly two weeks post-operation. The patient's family did not want a post-mortem.

Comment:

Management of a geriatric patient can be complex. Non-operative management in this patient with multiple co-morbidities was initially appropriate. A strictly defined timeline should be established at the

commencement of this type of treatment. Forty-eight hours rather than 72 hours may have been a better point at which to seriously reconsider management.

Throughout the care of this patient, there was good communication with close family members and between clinical teams. Clearly the family was very satisfied with the care, the communication, and the outcome.

This case demonstrates the importance of compassionate and honest communication in assisting relatives dealing with the emotional discomfort associated with a seriously-ill or pre-terminal family member. The ability to communicate successfully may not come easily but good communication skills can be learned. Work at your communication skills, seek expert help if you feel it is necessary, and always make time for explanations.

The Audit's surgical case form for this patient described the case well and was typed. The first-line assessor had no problems commenting on the case and stated: 'This sounds like a well-managed and complex case'. **We like to hear these comments!**



(2) Cholecystectomy in a high risk patient.

An elderly patient was admitted with haematemesis and RUQ pain. The patient's history included hypertension, transitional cell carcinoma of the bladder and peptic ulcer disease. The patient was also taking medications including clopidogrel - the indication for the latter was initially unclear.

Investigations on admission showed a high haemoglobin, a raised WCC and an elevated bilirubin but otherwise the liver function tests and lipase were normal. An abdominal examination was consistent with cholecystitis and an ultrasound on the same day reported gallstones, diffuse thickening of the gallbladder wall and oedema in the region. At this point, there was nothing suggestive of a gangrenous cholecystitis.

Triple antibiotics and IV fluid resuscitation were commenced and the patient was initially fasted. Clopidogrel was discontinued. The medical record confirmed significant clinical improvement within the first few hours of admission.

Efforts were then made to establish why clopidogrel had been prescribed. The reason for its use remained unclear. There was no history of transient ischaemic attacks, no history of stroke and no history of coronary stenting.

The patient stated that the pain had not improved but they felt considerably better. Although confused at times and trying to

climb out of bed, vital signs had remained within normal limits. The patient was commenced on clear fluids. There was no further haematemesis.

The patient remained confused and, that evening, was found on the floor after a fall. There were no injuries noted. An in-dwelling catheter was inserted to assist in general management.

Nearly a week after admission, the patient was reviewed by a surgical registrar and LFTs were noted to have worsened. For the first time, the patient required supplemental oxygen. Percutaneous cholecystostomy on that day was considered, but this would have required transfer to another hospital. Work-up was therefore commenced to undertake laparoscopic cholecystectomy. The patient was recognised to be a high-risk surgical candidate and review was requested from medical, anaesthetic and intensive care teams. The medical team noted the presence of pulmonary fibrosis, which was said to be progressive, with possible superimposed pneumonia.

The patient and family, after discussions, accepted that surgery was appropriate. Intensive care admission was anticipated. Before induction of anaesthesia, arterial and central lines were placed in the patient. At operation, the patient was discovered to have a gangrenous cholecystitis. Cholangiography was not undertaken. Operating time was an hour and a half. A drain was placed and the patient, still ventilated, was transferred to the ICU. Triple

antibiotics were continued and vancomycin added.

Despite persistent radiological changes on chest X-ray, the first few hours in intensive care were initially encouraging. Oxygen saturations slowly improved and the patient did not require further inotropic support. Inflammatory markers also improved. The patient was able to stand and walk with assistance on day three post-operation. The patient remained confused, although there appeared to be a slow but persistent improvement.

After nearly a week in ICU, a large intracranial bleed occurred. CT brain confirmed this as a terminal event and the patient was commenced on an infusion of haloperidol and midazolam. The following day there was increasing respiratory difficulty. The patient was not a candidate for further mechanical ventilation and passed away within hours.

Comment:

It appears that the patient did have significant pre-existing respiratory disease complicated by pneumonia. During conservative management of what was gangrenous cholecystitis, the condition worsened. With the benefit of hindsight, it seems the severity of the underlying pulmonary disease was not fully appreciated.

Despite a successful surgical procedure, the patient suffered a terminal intracranial bleed. The intracranial bleed could not be predicted but it was probably a

consequence, in part, of the anti-coagulation (clopidogrel). Platelet transfusion may be useful to reduce the risk of this complication.

Was conservative management the appropriate initial decision? In this case, it could be argued that in the presence of a significantly raised serum bilirubin, leucocytosis and pyrexia, obstructive bacterial cholangitis (ascending), in its early stages, should have been assumed. After appropriate resuscitation (including triple antibiotic cover), cholecystectomy and decompression of the biliary tree should have been considered within 24 hours.



(3) Patient dies after bypass for gangrene; documentation deficiencies!

This elderly patient underwent a right femoro-popliteal bypass and removal of gangrenous toes. Pre-existing conditions appeared to have included diabetes, a left AKA, coronary heart disease (a previous CABG) and renal impairment.

Audit assessment of medical records proved very difficult.

It was unclear in the notes provided whether there was more than one admission relating to the revascularisation operation and subsequent death, and whether important information was therefore missing.

Entry notes confirmed an ICU admission after a femoro-popliteal bypass but no other notes relating to any ICU stay could be identified. Also, there were no detailed admission notes regarding risk factors or discussion why the bypass was required.

Clinical notes refer to the bypass being performed and some toes being removed with further debridement of the foot occurring at a later date (notes suggest concerns over bleeding following this debridement). A medical student's note appears to indicate a four-unit transfusion was required but this is not clear. A nursing note comments on 'no urinary output' but it is not clear over what time. RMO notes with

a comment on the lack of entries in the fluid balance chart is present. The doctor notes '500mls of urine in the catheter bag'.

Ward round notes, written by a medical student, discuss the need for a 'further amputation'. An entry by a social worker notes some concerns over depression and the patient's decision not to have surgery. Further entries that day appear to highlight that the patient was withdrawn and refusing care. A number of nursing entries comment on limited urine output and on raised blood sugars associated with poorly controlled diabetes.

Another RMO note indicated that blood sugar had been raised for many hours despite receiving insulin. The patient was noted to have declined further insulin. An entry from the vascular team discussed the need for AKA. It was thought that the patient was not likely to be an ICU candidate, if a sudden event occurred. The patient could possibly be considered for ICU, if surgery was performed.

Ward round notes that '10 units of bld' (assume blood) had been given over 2 weeks and a further 3 units of blood were ordered. The cause of anaemia was not clear. A chest X-ray showed 'white out right lung'.

Referrals alluded to ongoing anaemia and were addressed to 'gastroenterology' and to 'endocrine' regarding 'cardiac failure'. The reviewing physician suggested 'hypoalbuminemia' not heart failure and that the anaemia was due to malnutrition.

Multiple notes were made regarding 'amputation discussions' which the patient had now agreed to. The patient was discussed with ICU consultants but an ICU bed was denied as it was felt it would not influence the outcome.

A right BKA was performed (after extensive discussion between the nursing staff, the patient and the family). The patient was noted to have 'reduced level of consciousness' and to have a 'high temperature' (notes indicated diabetes, previous CABG, neurogenic bladder and CRF). Blood results listed for the first time showed deranged LFTs.

Respiratory function began deteriorating and an ICU registrar was contacted and a decision was made 'not for CPR or intubation'. It was suggested that the pleural effusion be drained. A later note appears to indicate this was refused by patient and family. The patient subsequently died.

Comment:

Documentation is critical in medical records. Any notes made by a medical student must be countersigned by a registered medical practitioner. The Audit second-line assessment of this patient was almost impossible to complete. Many issues were never answered by the documentation. The treating practitioner (who was the primary surgeon for the patient) was less than professional for not ensuring that the medical record was adequate.

Questions raised because of poor documentation:

1. What was the cause of the anaemia? This question is never answered.
2. Could the pleural effusion have been drained earlier? It does not seem to have been diagnosed until very late in the course of this patient's time in hospital.
3. Why was the patient so difficult to deal with? Was there an underlying mental illness or other co-morbidity that would complicate this patient's progress?

Even when in doubt.....document, document, document !



(4) Cycles of death!

A young patient was brought to the ED of their local hospital following a high-speed motor cycle accident. On arrival, with GCS 5, the patient was hypotensive and bleeding from a wound in the right lower thigh.

Immediate resuscitation had begun, but despite major volume replacement, it was not possible to overcome severe hypotension and the patient was transferred to theatre immediately to investigate an intra-peritoneal cause for the bleeding.

At laparotomy, a laceration of the liver was found and packed. There was no other obvious intra-peritoneal bleeding found. There was a large pelvic haematoma related to fractures of the four pubic rami.

In an attempt to improve haemodynamic instability, orthopaedic surgeons placed external fixatur for the pelvic fracture. A compound fracture of the right distal femur was also treated with an external fixatur. The anaesthetic record in the operating theatre showed progressive drop in blood pressure until cardiac arrest occurred during the procedure.

Large amounts of blood and blood products were continually transfused but blood pressure never rose beyond mid-eighties systolic, in spite of entirely appropriate resuscitation. Trans-oesophageal echocardiogram excluded significant heart or major vessel injury. After going into asystole in the operating theatre, it was felt that further attempts at resuscitation were inappropriate.

The Coroner ordered a post-mortem examination which included a CT scan.

This showed multiple fractures of the face, sinuses, mandible, and some subarachnoid and intracerebral bleeding indicative of major brain injury. The chest showed fractured ribs, fractured scapula and fractured clavicle. The airways showed fluid and a small left pneumothorax with drain inserted. Abdominal examination showed only what was found at surgery.

Comment:

The Audit second-line assessor commented that there were no adverse events involved in the management of this case.

The patient had suffered multiple injuries as a consequence of a high-speed motor cycle accident and recovery was unlikely.

It seems that the extent of the pelvic fractures and related blood loss was not appreciated before the laparotomy. A pelvic binder at the scene of the accident may have been life saving.

Resuscitation seemed appropriate. The patient's injuries and delay in transfer from the scene of the accident to definitive care at the ED contributed to this patient's demise. The cause of death was hypovolaemia leading to irreversible shock.

A severe closed-head injury was noted at a limited post-mortem.

If there is any doubt or concern about the reasons why aggressive resuscitation failed in a shocked but otherwise fit patient, comprehensive post-mortem examination should be considered to clarify the exact cause of death for both surgeons and relatives. This provides some closure for all.



(5) But it's just my hernia, doctor!

This elderly patient presented to ED with a large umbilical hernia which had been unsuccessfully repaired with mesh some years before. The patient's GP had been consulted a number of times in the week prior. The patient was finally referred to a major hospital where they were admitted by a general surgical registrar.

The patient had a four-day history of diarrhoea with abdominal distention and significant vomiting. Although the abdomen was soft, the patient's large umbilical hernia was generally tender and only partially reducible. Bowel sounds were heard within the sac but the medical records described them as 'not normal'. The diagnosis was a 'partial bowel obstruction' and IV therapy was started.

After 24 hours, the patient was reviewed by the surgical team and, at that time, CT abdomen was considered appropriate and the request initiated. Less than four hours later, unfortunately while in the shower, the patient became hypotensive and wanted to go to the toilet urgently. The patient collapsed, arrested and died.

Comment:

Before admission to hospital, this patient had an irreducible hernia. On admission, the patient was only assessed by a registrar. Urgent or semi-urgent handover to the general surgical team did not occur.

The possibility of strangulated hernia with ischaemic bowel ('dead bowel') should have been top of the differential-diagnosis list. The junior doctor and the referral process have both failed.

Pathways to facilitate communication and collaboration also failed. These pathways were clearly deficient in this hospital. The gravity of this patient's predicament seems to have been missed.

When the surgical team finally saw the patient in the morning, there did not seem to be any priority given to the 'urgent CT', despite the significant history over more than four days.

In this patient's episode of care the following deficiencies are noted:

1. Less than timely and reasonable investigation
2. Poor communication between junior and senior medical staff
3. Poor consultant involvement
4. Lack of clinical insight at all levels of medical care

In an elderly patient with a four-day history of diarrhoea, vomiting, and abdominal distention, firstly consider 'dead bowel'.



(6) Late at night – not a good idea?

This elderly patient had multiple medical co-morbidities (diabetes, atrial fibrillation, blindness, deafness). GP advice, for many years, had been to ‘take salt tablets’ regularly for hyponatraemia. The cause of the hyponatraemia, however, was never clearly defined. The patient had been on anti-hypertensive medication for many years and had some low-grade renal failure.

The patient sustained an intertrochanteric fracture of the neck of femur after a fall at home.

After being admitted to hospital, surgery was delayed for 24 hours due to the hyponatremia.

The patient underwent open reduction with internal fixation. The operation progressed uneventfully. That evening, following return to the ward from surgery, the patient became hypotensive. An ECG showed some mild acute ischaemic changes. Hypotension was attributed to hypovolaemia and several litres of crystalloid were given in the first 24 hours in an attempt to correct the hypotension.

Urine output was still low and, over the following two days, it became obvious that acute renal failure was the diagnosis. A number of medical consultations followed and the ICU team was consulted. It was felt that in view of the extensive co-morbidities, advanced age, and poor quality of life that neither dialysis nor the use of inotropes was appropriate.

Simple supportive measures were then instituted. This decision was made in close consultation with the patient’s family.

Despite fluid restriction and non-invasive efforts to treat the renal failure (Resonium A and multiple doses of frusemide), renal function remained poor. The patient’s general condition deteriorated and, a week after surgery, the patient died of renal failure.

Comment:

Early resuscitation following surgery was left to probably the most junior member of the team. It was the first night and the ‘night RMO’ was the person responsible for this ‘resuscitation’.

It is almost certain that this medical officer was relatively inexperienced and did not appreciate that hypotension was due to factors other than hypovolaemia.

A large volume of crystalloid was infused and this was sufficient to cause marked fluid overload for those next few days.

Renal function remained poor. It is likely that this process hastened death which was due to renal failure. Maximum medical effort really did not change the course of events.

While definitive diagnosis was not possible from medical records review, other causes of hypotension should have been considered earlier in a post-operative elderly patient.

This case illustrates the problems associated with operating on very ill people late in the day. The patient returned to the ward

following the surgery after 8pm.

This inevitably meant that the problems surrounding fluid balance and hypovolaemia would be left to the most junior staff member in the late hours of the night or early hours of the morning.

Continuity of care is important, indeed vital in any clinical setting. Post-operative orders in this instance should have included precise parameters defining haemodynamic and fluid balance stability. A timely conversation between the surgeon and RMO, outlining the situation and expectation of treatment (especially overnight), may have resulted in markedly improved clinical care (and maybe a better outcome).



(7) Just another ‘ruptured’ aneurysm?

This middle-aged patient presented with headache and hemiparesis, after an intracerebral haemorrhage. The timely diagnosis was made at an outer-metropolitan hospital and transfer occurred to a major hospital with a neurosurgery unit. On arrival at the major hospital, GCS was 10.

A decision was made to proceed to surgery for evacuation of the intracerebral haemorrhage and clipping of the (presumed) underlying aneurysm.

A CT brain scan had been performed at the original hospital and probably was transferred to the major hospital through electronic radiology pathways. There is a note in the ED record at the major hospital that a CT brain angiogram was to be performed. The same note indicated that the neurosurgery registrar was not available and the angiogram was to be performed prior to the registrar’s seeing the patient. The note from the registrar suggests that the patient was seen shortly after the ED doctor’s request. However, there is no record of an angiogram being performed, either in a written note, or in any available CT reports.

The patient underwent a craniotomy and evacuation of the haematoma and attempted clipping of the aneurysm. Unfortunately, the clipping of the aneurysm was complicated by rupture. Control was eventually gained and the wound was closed. An intra-cranial pressure monitor was not inserted.

It is important to note that the operation record was signed (in type) by the consultant neurosurgeon. However, there is one line (in a different font) in the operation record which states ‘discussed with doctor (name deleted) - not for ICP - allow to wake/extubate tomorrow’. The author of this note is not able to be identified but the note does suggest it is not the author of the whole operation note.

The patient was transferred to the ICU and was neurologically unstable.

There are three episodes of right-pupil dilation, each of which responded to the administration of hypertonic saline. Because the patient responded, the decision was made not to perform another CT scan. This was eventually done the day after surgery and demonstrated what is described as a large recurrence of the intracerebral haemorrhage and an extra-axial mass (which is referred to as a subdural haematoma in the radiology report and an extradural haematoma in the operation note and neurosurgery notes). Subsequent surgery was undertaken.

Raised intracranial pressure continued and the patient did not regain consciousness but subsequently passed away after ventilatory support was withdrawn.

Comment:

This is not a particularly unusual case in neurosurgery. Patients with acute intracerebral haematoma in relation to the temporal lobe and associated with subarachnoid haemorrhage almost certainly have a ruptured intracerebral aneurysm.

These cases routinely require acute surgical intervention. Intra-operative rupture of a cerebral aneurysm is considered an adverse event and is associated with a poorer outcome following surgery.

The risk of the patient's dying from the haemorrhage alone would be considered at least to be moderate. The risk of the patient's dying without surgical intervention is almost assured.


There are areas in this scenario that should be questioned. Five areas of concern are listed below:

- 1. Was a pre-operative angiogram of any form undertaken?** There is no record that any angiogram was performed. Given that the anatomy of an aneurysm is important in planning the surgical approach, it is likely that the risk of intra-operative rupture increased substantially as the anatomy was unknown. Smooth access to or transfer of CT images between public hospitals has many annoying impediments. This technology is readily available from private providers. The transfer to the operating theatre was not immediately time critical given the neurological status of the patient.
- 2. The decision not to place an intracranial pressure monitor at the original surgery.** The technology for ICP monitoring is generally so widely available that any operative procedure where there is a risk of intracranial pressure elevation and the patient is unlikely to be able to be clinically assessed, should receive placement

of an ICP monitor. This patient falls into each of these criteria. There is a suggestion that the neurosurgeons expected that the patient would be able to be extubated the following day. This is hopeful given the intra-operative rupture of the aneurysm.

- 3. The ICU/neurosurgery unit collaboration.** Why was a CT scan not performed when the patient had several episodes of a dilated right pupil? The most likely explanation for this pupillary dilation is raised intracranial pressure. The thought pattern should have been to exclude a reversible cause. Indeed there was a surgically treatable cause for this raised intracranial pressure and the patient did indeed proceed to surgery. It is impossible to determine whether or not earlier surgery would have affected the outcome of the patient. Current therapeutic protocols demand that we define diagnosis of raised intracranial pressure and eliminate reversible causes.
- 4. Communication between medical teams.** On the weekend, there seemed to have been a disagreement regarding interpretation of the CT scan prior to the patient's returning to the operating theatre. There is no evidence in the notes that the consultant neurosurgeon saw the CT scan on which the decision to return to theatre was to be made.

A trial offering external access to X-ray images across public hospitals was undertaken by neurosurgeons in Queensland and all were offered



external access, from home, to multiple hospitals' images. It is uncertain as to whether or not the consultant in this case took up this offer. Although it is unlikely that this would have made any difference to the clinical outcome of this patient, it would have improved communication and decision making.

5. Was the communication between the specialist medical teams professional?

There is no evidence in the notes the specialist neurosurgeon attended the ICU at any stage after the patient's operation. There is evidence of communication through different registrars to the neurosurgeon. There were then differences of opinion between the specialists. These do not seem to have been communicated directly.

It would seem that a direct phone call between specialists and improved communication between neurosurgeon and intensivist would have maximised patient care. There is no evidence of any correspondence to the GP.

The death was expected given the pathology.

Communication in complex patient care is critical. We all need to work on improving our own communication skills.



(8) Decision before incision!

This young patient was initially sent to an outer metropolitan hospital ED by their GP. The diagnosis of an infected ingrown toenail was made but with some features suggesting ischaemia.

Prior to their admission, the patient complained of malaise and fevers, with RUQ abdominal pain and dysuria. The patient was morbidly obese, weighing 170kg. Furthermore, the patient had had a motorbike accident years before which resulted in multiple skin grafts to their right leg.

Examination revealed an ischaemic great toe with ischaemic changes in the tips of the 2nd and 3rd toes. The patient was reviewed within 24 hours of admission by the vascular team at a major hospital. It was noted that the WCC was raised, creatinine levels were grossly elevated, and LFTs showed high levels of bilirubin.

A CT scan of the abdomen was performed which noted bilateral adrenal nodules. Changes suggesting acute cholecystitis, with thickening of the gallbladder wall and stranding of the surrounding fat, were also seen. There was no evidence of obstruction of the biliary tree. The micro urine had over 500 white cells and 1000 red cells per high power field but, ultimately, did not grow anything other than *Candida* species.

The patient remained under surgical care. Multiple medical teams were asked to

review the patient. The endocrinology team were consulted regarding the adrenal nodules and initiated a series of investigations. They ultimately felt that these nodules were not secretory and, in particular, the patient did not have Cushing's syndrome (though the patient was noted to be hypothyroid).

A subsequent ultrasound scan of the liver suggested coarse liver texture in conjunction with an increasingly cholestatic picture. The possibility of non-alcoholic steatohepatitis was raised, with an element of cirrhosis. There was no evidence of gallstones but, nonetheless, the gallbladder was felt to be a potential source for the apparent ongoing sepsis. In addition to renal failure and worsening liver function, the patient developed a progressive thrombocytopenia with a coagulopathy.

A percutaneous cholecystostomy was undertaken despite reservations about clotting, as the patient did not appear well enough to undergo a laparoscopy and cholecystectomy. This procedure resulted in the drainage of a small amount of clear bile and a normal cholangiogram was noted. The patient developed respiratory failure following this procedure and was admitted to ICU and started on BiPAP.

At this stage, there was organ dysfunction involving lungs, liver, kidneys and thyroid (with evidence of ongoing sepsis). The source of the sepsis remained unclear. Nuclear medicine specialists felt that the patient was too obese to undergo a labelled white cell scan or a Gallium scan. The

possibility of endocarditis was raised but, again, it was felt that a trans-oesophageal echocardiogram would not be technically achievable. The ischaemic changes in the patient's toe were thought to potentially be a consequence of septic emboli.

Renal function slowly deteriorated with worsening hyperkalaemia. Cardiac arrest occurred 24 hours after admission. There were some difficulties with intubation but the patient was successfully ventilated and cardiac output was re-established. There appeared little sign of improvement, and support was ultimately withdrawn. The patient's death followed soon after.

Comment:

Difficulties in establishing the source of sepsis in this patient were very much related to the patient's body habitus and obesity. This would certainly compromise the quality of any abdominal scan undertaken and preclude other scans being done. The clinical pathway also illustrated the tendency for these patients to have a cascading series of complications following an initial event. Morbid obesity is a life threatening condition.

The treating team could have done little more to save this patient. The resources of the major hospital were comprehensively used with reviews from a wide variety of specialist teams. The only apparent source for sepsis on the imaging was the gallbladder. The percutaneous cholecystostomy was an appropriate means of addressing this, accepting that even this was a risky intervention given the patient's

coagulopathy. An attempt at a laparoscopic cholecystectomy, particularly if the patient did have established cirrhosis, may well have brought about their demise even earlier.

It was not felt there was anything more the treating team could have done to salvage this particular patient.

'Decision before incision' could be the best advice possible when treating such patients. Cholecystostomy was possible, prudent, but not curative.

Remember, the morbidly obese, regardless of their age, are terminal patients in most circumstances.

'Decision before incision'.... wise words!





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