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Western Australian Audit of Surgical Mortality

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Case Note Reviews

August 2006

Australasian and New Zealand Audit of Surgical Mortality

Royal Australasian College of Surgeons

CASE NOTE REVIEWS

The WAASM and TASM audit deaths that occur whilst under the care of a surgeon using the same methods and protocols. All completed surgical proformas returned to WAASM or TASM, are reviewed by a first-line assessor. Where there is an educational point to be highlighted or there appears to be factors that warrant further investigation, a second-line assessment is undertaken. A consultant from a relevant specialty in a different hospital prepares this review. Second-line assessments are based on information provided by the surgeon who completed the surgical proforma, and from the case notes. These reports undergo minor editing if necessary, and are anonymised.

A selection of the case note reviews from WAASM and TASM, some of which have been edited further to decrease their size, are combined here into a booklet and sent to all surgeons for educational feedback.

Correspondence regarding individual cases presented here is not possible, however WAASM and TASM welcome any comments.

Cardiac failure, secondary to excessive fluid, under-treated and wrong antibiotics given for chest infection

SUMMARY

A 64 year old male underwent an elective right hemicolectomy for a large benign polyp. His past medical history included ischaemic heart disease with a myocardial infarction 26 years ago. There were no recent cardiac symptoms, but significant alcohol intake. On the first post-operative night he went into alcohol withdrawal (DTs) which was treated with diazepam. On the fourth post-operative night he became confused and desaturated. Oxygen saturations were only 76% on room air and 90% with Hudson mask at 6L. He was reviewed and thought to have pulmonary oedema and a chest infection. He was treated with IV gentamicin, flucloxacillin and frusemide. He continued to deteriorate and became tachycardiac. He was then given a further dose of diazepam. He had a cardiac arrest in the early hours of the fifth post-operative day. No blood investigations were performed on the fourth post-operative evening when the patient was deteriorating. An ECG was done, which showed significant ST changes indicating myocardial ischaemia. This does not appear to have been reviewed.

COMMENTS

I feel that this 64 year old male died from cardiac ischaemia and pulmonary oedema, which was under-treated. The use of diazepam during this time may have exacerbated his respiratory failure. It may well have been that the patient was confused secondary to pulmonary oedema and hypoxia, rather than alcohol withdrawal. I agree that blood tests, including troponin should have been ordered on the night that he was deteriorating. I reviewed his fluid balance chart. It is quite common for bowel resection patients to require large volumes of intravenous fluids, as they are extremely dehydrated pre-operatively with the bowel preparation. This large volume of intravenous fluid (15.5 litres in 3 days) may have contributed to his pulmonary oedema. I suspect that this man's death was secondary

to a cardiac ischaemic event and pulmonary oedema. Was this confirmed on post-mortem? (A post-mortem was requested by surgeon but not done - Editor). If he did, then my area of concern is that he was under-treated for this. An ECG performed some five hours before his death showed cardiac ischaemia. A troponin blood test was not ordered. If cardiac ischaemia had been diagnosed, he may have been more aggressively treated in either coronary or intensive care. This may have altered the outcome. I agree that there was a delay in prophylactic heparin, although this is not unreasonable and did not contribute to the outcome. He was given inappropriate antibiotics for a chest infection.

Another concern is the extremely poor discharge summary. This states that the patient died, but it reads as if he underwent an uneventful right hemicolectomy. Nowhere does it state that the patient had any complications or a cardiac arrest.

Anastomotic leak

SUMMARY

I have only been provided with the case notes to the date of the patient being readmitted to hospital, then to their death. It may be that assessment of the previous admission may reveal pertinent data.

This was an elderly patient living alone who was, I understand, coping despite diagnoses of peptic ulcers, dementia, hyperthyroidism, trans-ischaemic attack from hypertension, anxiety and depression. She had recently been admitted to hospital with anaemia. This was found to be related to cancer of the caecum. After appropriate screening the patient underwent a right hemicolectomy. There was a slow recovery followed by a transfer for post-operative rehabilitation.

Four days later the patient was transferred back to acute hospital with a possible chest infection. The patient was identified as having ongoing abdominal pain, shortness of breath, right pleuritic chest pain, feeling of being cold and shivery and diarrhoea.

These symptoms had been present for the previous two days. On admission (day 1), she was obviously unwell with a fever 37.8, pulse 110, raised respiratory rate 25 (but satisfactory oxygenation), but there was evidence of decreased air entry on her right base. Her abdomen was noted to be generally tender. Her Hb was 89 and WBC 19.8. She was also moderately hypokalaemic and INR was slightly prolonged at 1.7. She was managed as for a chest infection.

On the ward round the next morning (day 2) she was handed to the Medical Unit. I believe, but have no definite evidence, that she had recently been a patient in the Medical Unit. It is not clear from the notes who saw her at that time, but at the round ward, the question of a subphrenic abscess was raised. Her haemoglobin by then was 75 and a transfusion was organised.

A CT scan was performed early in the afternoon of day 2. She was reviewed following the CT by the evening doctor. He noted that the CT showed evidence of right para-colic, para-anastomotic abscess. There was no evidence of pulmonary embolism. A surgical consultation was requested and the patient was reviewed 15 minutes later. It is unclear whether or not he discussed the patient with the consultant, but arrangements were made for a CT guided drainage. The patient was reviewed by several doctors that evening. The Medical Unit doctor indicated that she should be handed back to the surgeons and indeed the handover occurred to the evening surgical intern. The night doctor was unable to re-insert an IV.

The following morning (day 3) she was again seen by the surgical registrar and arrangements made for CT drainage that morning. There is comment in the notes "query surgical drainage". The CT guided drainage was delayed because the INR had not normalised. Due to the absence of IV access the intravenous vitamin K had to be given orally.

I am unclear as to which antibiotics and by what route the patient had been treated. There is an order for Amoxycillin and Metronidazole to be given IV (? day 5) and a day later (? day 6) there is an order for Gentamycin 240 milligrams. On the morning of day 6 the patient was again seen by the surgery registrar. She was noted to be afebrile, HR 101, and the observations generally normal. It was again noted that CT guided drainage was not possible until the INR was normalised. The patient described herself as "so-so".

During the course of the day there were obviously discussions, CT drainage was in fact performed on day 6 and "a very foul smelling yellow material 100mls aspirated". Apparently the patient felt a little better after this procedure, but her urine output was low, and arrangements were made to transfer the patient to "SSU at 1900 hours". From reading the notes it would appear there were problems with fluid, it being difficult to ensure adequate urine output without causing possible fluid overload.

The following morning the patient was again reviewed by the surgical registrar who made a note that he had discussed an operation with the patient's son and also

in the entry is a note that he had discussed the case with the surgeon, in particular the need for operation.

It would appear that venous access was still an issue, at 1300 hours a surgical intern makes note of a 22 gauge IV cannula placed on the medial aspect of the left wrist.

On the evening of day 9 she underwent a laparotomy and a large collection was found in the right upper quadrant. There were also a few foci gangrenous patches in the large bowel with leakage of faecal fluid. The actual anastomosis appeared intact, but on the reasonable assumption that it was leaking, was resected and, the distal end closed, the proximal brought out as a stoma.

The patient was admitted to HDU overnight, resuscitation continuing, intravenous access had been achieved by this stage. The patient was reviewed the following day by the ICU consultant. The review appeared to be satisfied with the progress and indeed planned return to a ward bed. It would appear that this did not occur. The patient was reviewed by the surgical consultant who decided the patient should stay in ICU. At 1800 the patient underwent a massive vomit which was complicated by an aspiration. The patient had been sleeping comfortably and various notes indicate considerable degree of lethargy and somnolence. The patient was intubated and ventilated.

A few hours later, the patient appeared to be deteriorating and various indicators suggested a "further intra-abdominal catastrophe now compromising respiratory and haemodynamic status". She was returned to the operating theatre on the same day but there was no obvious intra abdominal pathology.

Unfortunately the patient underwent a cardiopulmonary arrest in the operating theatre and could not be resuscitated and was pronounced dead.

COMMENTS

I have some concerns that her prolonged and slow recovery for a reasonable procedure may have been partly as a result of intra-abdominal sepsis. Although it should not be an issue this lady did arrive late on Christmas Eve.

Her return to theatre should, perhaps, been more expeditious. Associated with this is the issue of whether CT drainage is a treatment for a leaking anastomosis with abscess formation. The patient's return for definitive surgery was delayed in fact by 48 hours while attempts were made to control her problem non-surgically. From the notes it would appear that the patient was not "in extremis" and with the wisdom of hindsight, I would recommend that such patients return as soon as possible for a definitive laparotomy if their condition at all permits it.

I am concerned that the 48 hours or so before the operation could have been better spent in more active resuscitation. Venous access and fluid management seems to have been a problem during this time and she would have been better managed in an area such as the High Dependency Unit with a CVP.

Although documentation of the patient in general was of a high standard, it is not possible to find much record of discussion with senior surgical staff until the decision was made to return the patient to theatre some 48 hours after the presentation to hospital.

RECOMMENDATIONS

Factors which potentially may have been improved upon:

1. More speedy return for laparotomy;
2. More aggressive resuscitation;
3. Central-venous access;
4. More careful pain control to reduce the risk of aspiration;
5. Better recording of discussions indicating early and frequent involvement with senior medical staff; and
6. Review of X-ray policies regarding "correction of INR prior to drainage".

Delay in referral to surgeon

SUMMARY

A 77 year old female presented with a large bowel obstruction and the plain abdominal film showed considerable dilatation of the transverse colon. The relevant past history included some investigation three months prior to admission because of ongoing constipation and general deterioration of health. There is no doubt there was a delay in the diagnosis, approximately a two month interval. One month prior to admission she was noted on a CT scan to have multiple liver metastases but no primary site was identified. Following admission to hospital she was seen by one consultant surgeon and it was decided at that stage, given that it was on a weekend, that a conservative approach would be safe. She was subsequently seen by the second consultant surgeon four days later. There had been little progress with regard to her obstruction and the surgeon discussed with the patient and her relatives the possibility of a palliative resection with a view to a defunctioning stoma. The decision was made to carry out surgery which was duly undertaken on the following day. Following a laparotomy it was found that the patient had widespread intra-abdominal metastases and with liver secondaries. It was impossible to access a free loop of bowel to bring out as a stoma. In the context of advanced malignancy and following a laparotomy she deteriorated and died six days following surgery.

COMMENT

The only real area of concern is regarding the delay in diagnosis. She was referred to a consultant gastroenterologist the previous year and no actual diagnosis of the metastatic cancer was made until at least two months later. I do not believe this would have made any real difference in the ultimate outcome, but such a delay would appear to be inappropriate.

The only other area of possible concern that I would

have is the overall question as to whether or not a laparotomy should be undertaken in the context of obvious liver secondaries. This is a decision for which no clear rules can be made, it is a personal decision which can only be made between a surgeon, the patient and relatives, and on occasion some relief can be had for a patient's terminal care with the resolution of an obstruction. It is also extremely difficult to know whether or not a totally incurable or inoperable condition is present in the peritoneal cavity based on CAT scans.

In conclusion I would have no real criticism of the management of this case other than to say that on some occasions it is possible to manage these patients without surgery. But the actual decision is a very personal one and I do not believe one can criticise in a retrospective manner the decision that was made in this case.

Compromised patient suffering from trochanteric fracture of the hip who struggled with fluid management

SUMMARY

This 93 year old female patient had an extensive past history having been admitted to a teaching hospital about two years before this incident with an acute myocardial infarction. She had a previous history of ischaemic heart disease and had refused to have coronary artery bypass grafting. In addition she was noted to be a Type II diabetic with renal impairment and atrial fibrillation.

On this occasion she had fallen at home sustaining a displaced subcapital fracture of the left hip, the definitive diagnosis being made by x-rays. After discussion of the seriousness of this situation, both with the patient and her family, and following discussions with the orthopaedic consultant on call, she was taken to theatre within twenty four hours where a senior surgical trainee carried out a cemented hemiarthroplasty of the hip. This appeared to be uneventful. This was carried out under general anaesthetic with a later insertion of a lumbar plexus block. Her blood pressure appears to have been satisfactory during the operation. In the recovery room between the hours of 2340 and 0000 there was a drop in blood pressure from approximately 150/80 to 85/45. This low blood pressure persisted for three days. There would appear to have been little drainage but I cannot find complete records of this. At the same time her urinary output dropped significantly. Repeated challenges of 250ml of saline were instituted with little response in relation to blood pressure or urinary output. I am unable to find a complete fluid balance record. Her haemoglobin was noted to be 81 on the morning following surgery. Later this day a chest x-ray suggested early pulmonary oedema. Her troponin level was 0.11. It would appear that a total of five fluid challenges of 250mls of either gelofusine or normal saline were given in the forty eight hours following surgery. Two units of blood were also given. The following morning the troponin was again measured

and came back at 30. Anticoagulation had not been recommenced at this stage due to a previous ilio-psoas spontaneous haemorrhage related to previous anticoagulation on her previous admission. The patient was also noted to be very confused.

Three days after admission it was noted she had a large anterior myocardial infarct and that the prognosis was very poor. The family made it very clear at this stage they did not want any further intravenous fluids given. She died in the early hours three and a half days following surgery.

COMMENT

My major problem in trying to put together the accurate history here is the absence of any fluid balance charts. The only charts I could find were input charts but no output charts. Two days following her injury it was noted by the medical registrar that she was in positive fluid balance of 3500 mls. It would appear that in the first forty eight hours after surgery this patient had six litres of replacement fluid, two units of blood and seven episodes of fluid challenge of either 200mls or 250 mls, usually normal saline or gelofusine. I cannot in any way find her urinary output, although numerous comments were made that this was in the region of 15 mls per hour.

In retrospect the sudden drop in blood pressure coincided with her myocardial infarction and the patient's non-response to these fluid challenges should perhaps have raised questions earlier. I do not think that that this would have made any difference to her demise. I do not think that the drop of haemoglobin to 8.1 grams precipitated the myocardial infarction. I think that her ischaemic heart disease, Type II diabetes, renal impairment and atrial fibrillation all contributed.

I note that the surgical case form that was filled in by a service registrar where as the operating surgeon was a different person, an Advanced Surgical Trainee.

Post-operative death in an elderly patient with a femoral neck fracture and chronic obstructive airways disease.

SUMMARY

This elderly man fell during the early hours of the morning in an aged person's residential complex. He was transferred to a private hospital where he was admitted during the middle of the night. He had a past history of pulmonary tuberculosis, for which he had undergone therapeutic pneumothorax and a subsequent thoracoplasty and a recurrent laryngeal nerve palsy.

On the day of admission he underwent internal fixation of his hip fracture with a dynamic hip screw and closed reduction of his forearm fracture. Post-operatively he had respiratory difficulties and was left intubated, but breathing spontaneously and was managed in the ICU. It became apparent over the next day or two that he had suffered a cerebrovascular accident. He was extubated on the day following surgery and oral feeding was commenced twelve days later after video fluoroscopy

assessment. Two weeks following his admission his condition deteriorated at which time it was thought that he was suffering from aspiration pneumonia. He died later that day. There is no indication of just when the cerebrovascular accident occurred. I note that the patient was generally hypertensive and suffered brief periods of hypotension during the anaesthetic and again in the Intensive care Unit.

COMMENTS

In my opinion the management of this patient was appropriate at least from a surgical point of view. The patient was in an age group and had a number of co-morbidities such that the injury he sustained put him at a significant risk of dying, probably in the order of 20% in the first weeks after injury. There is nothing from a surgical point of view which might have been done differently. Whether regional rather than general anaesthesia would have made a difference is not for me to comment on. The quality of medical records is on the whole high. Even though the patient sustained a cerebrovascular accident and had recurrent laryngeal nerve palsy which was noted by the speech pathologist to place him at a risk of aspiration there is little that could have been done differently. The risk was noted and adequately assessed by video fluoroscopy. I note that DVT/PE prophylaxis was put in place at the time of surgery.

Leaking aortic abdominal aneurysm missed

SUMMARY

The proforma for this patient was completed by the Advanced Surgical Trainee. It contains a number of factual errors suggesting that it was not completed in a diligent manner.

This 78 year old man had multiple medical problems including diabetes, hypertension, chronic renal failure and atrial fibrillation. Eight months prior to this admission he was diagnosed with a six centimetre abdominal aortic aneurysm, but after review it was felt that he would not survive elective resection. In addition to this he had severe osteoarthritis. This had deteriorated to the point that the patient was essentially chair-bound. After a full discussion between the patient and the consultant surgeon, and supported by an anaesthetic review, a decision was made to offer a hip replacement. This operation proceeded uneventfully. His post operative recovery for the first 24 hours was uneventful. He was then reviewed because of a low urine output and it was noted at that time that his blood pressure had fallen significantly. During the course of the next three days there are numerous entries in the notes to his low urine output and blood pressure. A MERT was called on three occasions and eventually he was admitted into the ICU. It was not until he developed bruising in the flanks that the possibility of a ruptured aortic aneurysm was considered. He was reviewed by a vascular surgeon, but it was felt unlikely that he would survive surgery and palliative care was introduced.

COMMENT

I believe there are a number of issues that the surgical team need to review. It has long been recognised that abdominal aortic aneurysms have a greater risk of rupture in the post operative period. Over four days this gentleman was reviewed by a number of clinicians from different specialties who offered advice about his low urine output and hypotension (systolic BP < 80mmHg). Yet none appear to have considered the possibility that his known abdominal aortic aneurysm might have ruptured. One consequence of this was that the heparin was changed to clexane.

Although the form suggests that this gentleman was given a DVT prophylaxis his clexane was not started until 24 hours after his surgery. I can find no evidence that he was given any DVT prophylaxis prior to surgery, nor that TED stockings were fitted as stated in the proforma. In addition the clexane was stopped after 48 hours and changed to heparin, but there was a gap of 40 hours between the change over. This cannot be considered adequate prophylaxis.

The proforma also suggested that this gentleman was not managed in the ICU. In fact he was transferred there after four days and this is where he died.

Finally, the trainee completing this form indicated there were no areas of concern, consideration or adverse events. To this reviewer's mind this is not correct.

Poor documentation in notes

SUMMARY

A 65 yr old lady presented with a 12 hour history of 7/10 abdominal pain, vomiting, temperature 35.5, pulse 60-80 BP 221/96. She was reviewed by a doctor six minutes later. Her abdomen was tympanitic. There was a mass to the left of the midline lower abdomen. She was discussed with the surgeon who advised 'drip and suck' until reviewed.

Seen 2240 by surgeon. No record of findings. Later patient collapsed on way to toilet. Review by doctor 0440. Peripherally shut down. No pulse palpable in cubital fossa. ECG showed sinus tachycardia. Her abdomen was distended. A diagnosis of septic shock, possible ischaemic gut, was made. She was discussed with the surgeon.

Given her poor health she was considered unsuitable for theatre, unsuitable for CPR in case of arrest. NFR order

These comments duplicated in surgeons notes at 1400 the next day. At 2200 there was deterioration in her condition. The surgeon was notified, but she was declared dead 0325 the next day.

COMMENTS

1. We do not know full medical status. Comments about "poor health" with no evidence for this statement?
2. There was no record of surgeon's initial assessment

and findings in either in his notes or nursing notes - only that Fleet enema was ordered.

3. There was no record of discussion with patient or relatives about condition and management options. It maybe that surgery was refused but there was no record of this.
4. It could have been an extensive mesenteric ischaemia or a localised loop of ischaemic bowel that perforated - peritonitis- death.
5. Mesenteric ischaemia was a clinical diagnosis. No laparotomy or post mortem was done.

The above five points merit discussion and improvement in future cases. It is probable that management was appropriate and the outcome as expected but there is no documented evidence to support this.

Delays in treatment and referral

SUMMARY

This 69 year old woman was transferred to a teaching hospital three days after admission to a peripheral hospital with an infected and obstructed right kidney. I have studied the notes provided from the teaching hospital about this case. My analysis of these notes is that the patient was properly and compassionately treated during her time at this hospital.

COMMENTS

However, in my view, the battle was lost before she reached the hospital. One of the difficulties in analysing the death of such a patient is that one only sees the notes of the hospital where the patient died, not the notes of the other hospital the patient was in during her final illness.

It seems to me that for three days she languished in the peripheral hospital, being treated appropriately with the correct antibiotics of gentamicin and ampicillin. However, it is recognised by all urologists that one of the key emergencies that we deal with is the obstructed, infected kidney. She should have been transferred on the first day of her admission to the peripheral hospital. After that, it was a downhill battle.

This next comment is academic rather than pragmatic. I note that the decision to stop treatment was based, largely, on the report of the CT scan, which showed multiple metastases within the liver. There is, in fact, no tissue diagnosis of her cancer, and it is possible, but unlikely, that she had multiple abscesses within the liver.

What a pity that there was no post-mortem examination.

Overall, I would emphasize that the care she received at the teaching hospital was totally appropriate.

Following receipt of this review the notes were obtained from the original hospital. The second line reviewer was asked to reconsider the case in the light of the additional information. It is normal practise to obtain the notes of the original hospital if it seems relevant. The importance of

doing this is well illustrated in this case. A copy of the second line review is sent to the original clinician, regardless of their specialty.

Subsequent review of case notes from referring hospital

SUMMARY

My review of the notes from the peripheral hospital confirms my suspicion that there was a 48 hour delay in the time of the patient referral from peripheral hospital to the tertiary hospital.

The patient was admitted in the morning and a provisional diagnosis of acute cholecystitis was made, which seems reasonable based on the description of the history and clinical signs available to me.

She was put on appropriate antibiotics and the following morning a request was made for an urgent ultrasound of the abdomen. It was recorded in the notes written by the nurse early afternoon the following day that the patient was extremely unwell and deteriorating.

Nonetheless, it was not until two days post admission that an ultrasound of the abdomen was carried out. This confirmed that there was obstruction of the right kidney, and it is recorded that pressure of the probe over the gallbladder caused no discomfort.

Post-operative death in an elderly patient admitted for elective surgery

SUMMARY

A patient was admitted for an elective THR. He has severe pain due to osteoarthritis of the hip. He had multiple co-morbidities. In particular a preoperative cardiologist's opinion commented "surgery may be quite hazardous in this patient" and "he is keen to go ahead and have an operation.....but I think it is unwise." The operating surgeon felt there was an 80% chance of the patient dying. Anaesthetic assessment was ASA 4.

Surgery was undertaken and there was no recognised intra operative complication. On the evening of the procedure poor urine output was noted and the anaesthetist advised, no action undertaken.

On the day following surgery poor urine output was again noted both in the morning and the evening. No action taken. He was confused at night and his observations record that by 2000 his oxygen saturations had dropped from 99% on oxygen in the morning to 93% on oxygen and his respiratory rate had gone from 9 to 19/min.

At 0620 on the second day following surgery he was breathless, oxygen saturations on 4L/min of oxygen were 94% a drop of 6% compared to immediate post-operation NB admission baseline preoperative oxygen saturation's not recorded although protocol for it exists. His respiratory rate remained about 19/min. He was noted to have a positive fluid balance of greater than 3 litres (he was probably developing or in pulmonary oedema).

At 1300 on day two he was nauseated and tired, no oxygen saturations were recorded as he has gone onto QID observations as the pathway required. Between 1030 and 1600 there were no observations undertaken. Under observations, the pathway misleadingly suggested that the patient was haemodynamically stable. This was not the case for when the next sets of oxygen saturations were undertaken they were 85% and at the same time, not recorded, he had chest pain. At 1700 the HMO was contacted, the patient was not seen, but lasix ordered and an ECG requested, performed at 1755

At 1900 a chest x-ray was undertaken which confirmed acute pulmonary oedema. Consultant care was initiated and he was transferred to ICU but died six hours later. Investigations undertaken on the day revealed a rising creatinine and an elevated Troponin. It was assumed that he had an AMI and went into pulmonary oedema but it may be that his relative fluid overload led to pulmonary oedema, hypoxia thus precipitating an AMI.

QUESTIONS FOR CONSIDERATION:

What level of mortality risk is too great when considering elective surgery even if the patient requests a procedure? Could his pain have been controlled by non operative measures? Given his known cardiac state should he have had a CVC for monitoring? Should his postoperative care have been undertaken in an ICU or HDU? How can a mechanism be established that alerts nurses and clinicians that something is seriously wrong?

COMMENT

These pathways do not demand action, they do not warn of impending problems. Oxygen saturations should be graphed/recorded against the oxygen disassociation curve taking into account the administered oxygen. A drop from say 99% to say 94% is not recognised as being nearly as serious as it is. If this type of data (as above) i.e. observations were to be entered into a computer (PDA) a simple algorithm would clearly warn all involved that something is going wrong. Some positive response may then be prompted.

Clinicians and nurses may be "blinded" to a changing situation for many reasons. This has been previously documented. A review of the pathway system is required. This system is a tool which works well when all goes to plan but it seems to work poorly when there is a changing situation.

Delay until infection cleared may have helped

SUMMARY

This patient was admitted to a private hospital with evidence of a fractured right neck of femur. It would appear that the patient may well have suffered this injury some six days previously, when she fell. Previous investigations three to four years earlier suggested that she was a very likely patient to suffer traumatic fractures because of her degree of osteoporosis. She also had a past history of renal problems and on admission

was noted to be a woman of tall stature and certainly not well nourished.

Her films showed evidence of a subcapital fracture and it was decided to operate and carry out a hemiarthroplasty. This was performed on the day following admission, it being noted from the investigations on the previous day that her C Reactive Protein (CRP) was 250 mlgs per litre suggesting the presence of infection. The CRP did not rise significantly as a CRP done 10 days post operatively showed a figure of 280 mlgs per litre.

I note on reviewing the operation it was recorded on opening the right hip that pus was discharging. Pulse lavage was carried out using normal saline and the capsule closed. A second procedure five days later involved a right bipolar hemiarthroplasty being inserted and it was noted on making the approach that there was haemosiderus fluid within the tissue plains but as it stated, no pus. Swabs nevertheless were sent to microbiology.

COMMENT

I believe that having found so called pus draining from the hip on the initial operation that the patient could have been treated for a much longer period with traction while further treatment of the infection was carried out, and then at a later stage, consideration be given as to whether a prosthesis would then be reasonable, but it would be at the time that the CRP and ESR would have returned to normal.

I think on exploring the hip again at the second operation, the presence of haemosiderus fluid was indicative of an abnormal situation although one has to remember that the tissues had been breached only some five days previously. Certainly the swabs of the second operation did grow the presence of a mixed bag of organisms sensitive to both the Ciprofloxacin. I think it has to be perceived that the above patient was certainly systematically not a patient who was terribly well and I think the infection provided a cause for multi organ failure.

Does community use of anticoagulants (Warfarin) influence surgical outcomes

SUMMARY

An 83 year old lady with past history of left mastectomy, CVA, deep vein thrombosis and dementia (hostel accommodation) but mobilising with a wheelie-frame fell in the bathroom, without associated head injury and sustained a fracture of the right neck of femur. On assessment at the Emergency Department of a metropolitan hospital, she was found to have a displaced subcapital fracture of the right femur. She was admitted for planned surgery the following day. On assessment, the INR was noted to be elevated (2.2) and surgery was deferred, with cessation of her warfarin medication.

Pre-operative management was undertaken on the ward. An IV line was inserted. Fluid balance was maintained apart from a period where no IV access was available

(15 hours) during the first 24 hours after admission.

By day two of admission, she became increasingly more aggressive and her oxygen saturation was noted to be below 90. Chest signs developed and aspiration was suspected. Speech therapy assessment defined difficulty in swallowing. Passage of a naso-gastric tube was unsuccessful.

Six days post admission, the INR was noted to be modestly improved (2.0) and despite a chest xray showing signs of patchy consolidation, an anaesthetic assessment cleared her for surgery, which proceeded on the seventh day post admission.

A routine cemented hemi-arthroplasty was performed. There appeared to be no peri-operative issues apart from a mild hypotensive episode, presumably related to cementation. Surgical time was not excessive.

Post-operatively, a decision was made to treat this lady in the high dependency unit which seemed appropriate. Her condition however deteriorated in the recovery ward and she succumbed within six hours of surgery.

A post-mortem was undertaken. The post-mortem changes of pneumonia and cardiac failure were diagnosed by the pathologist.

COMMENT

The presentation of an elderly female with a displaced subcapital fracture of the femur is not an unusual occurrence in hospital orthopaedic practice. That this presentation is increasingly accompanied by patients who are medicated with anticoagulant therapy (warfarin), seems to be increasing. Although past history of deep vein thrombosis was provided, any thrombotic episode was distant. Increasingly, patients are anticoagulated for the simple management of atrial fibrillation.

In this lady's case, she presented with an elevated INR and it would appear a decision was made to allow this to spontaneously drop to acceptable levels, before surgery was undertaken.

Six days after admission, her INR level remained elevated (2.0). In the interim, there clearly had been cardio-pulmonary deterioration of function with documented evidence of difficulty in maintaining oxygen saturation levels. Hypoxia remains a recognised cause of aggressive or disorientated behaviour. This was clearly documented in the medical notes as occurring from the second day of admission. Fat embolism is a recognised complication of major long bone injury and it is likely that this lady was manifesting this. There was no documentation regarding the use of traction and the question needs to be asked that if a delay in treatment was expected, why wasn't traction utilised. Whilst this may not have prevented fat embolism, it may have assisted in the nursing of this patient.

Warfarin therapy can be reversed by the use of vitamin K and/or fresh frozen plasma. In the surgical setting, fresh frozen plasma can be utilised. It is unclear as to whether this was considered pre-operatively.

What is known is that early surgery in the presence of

neck of femur fracture has been documented in the medical literature as producing better outcomes. Conversely, delayed surgery, as occurred in this case, has a predictably poorer outcome.

This patient clearly followed the latter course. With the well documented aging of the population and an apparently increasing use of not only warfarin but other anticoagulants in the community, this is an issue that perhaps should be addressed sooner rather than later.

Unclear radiology report may have led to unnecessary surgery

SUMMARY

A 75 year old male patient was transferred from a peripheral hospital to a teaching hospital after suffering a fall and diagnosed with a fracture of neck of femur. A proximal femoral nail was inserted and the patient developed respiratory failure and died two days later.

COMMENT

There are two problems related to this assessment. One is the question of fluid overload. The patient always had a good urinary output and although he had seven litres of saline in the 72 hours prior to death there was only a positive balance of three litres. However a pre-operative cardiac assessment showed that the patient had significant problems with cardiac muscle and the biochemistry suggests that haemo-dilution was occurring. I feel that in the 24 hours prior to death more vigorous use of intravenous lasix and reduction of fluid would have been appropriate.

The other major problem we have with this case is that it is unclear from the radiology reports as to whether this patient actually had a fracture which required internal fixation. There was certainly a fracture of the greater trochanter, but there is confusion as to whether there was an inter-trochanter or sub-trochanteric fracture.

There was a handwritten report from the radiologist suggesting that there was an undisplaced fracture in the sub-trochanteric region, but a typed report on the same CT scan that there was no fracture and obviously the operation in a frail elderly patient with ischaemic heart disease is a major precipitating factor in the patient's death.

Pulmonary embolism may not always be prevented despite attempted thromboprophylaxis

SUMMARY

A 33 yr old woman with menorrhagia had a total abdominal hysterectomy after counselling regarding alternative treatments, which she rejected. She was obese (93 kg), and being treated for hypertension and asthma. She had taken the oral contraceptive pill continuously for two months up to the date of operation, in order to control her uterine bleeding. A routine

abdominal hysterectomy was performed by an O&G registrar and consultant. After an initially uneventful recovery, she collapsed with chest pain and dyspnoea some 45 hours after her surgery. Cardiopulmonary resuscitation was performed for over 60 minutes, along with resuscitation with fluid, adrenaline and atropine. An echocardiogram revealed a dilated right ventricle suggesting a diagnosis of pulmonary embolism and she was given 1.5 million units of Streptokinase intravenously and admitted to an ICU. She deteriorated with a VT arrest which reverted with a pre-cordial thump. She was paralysed and mechanically ventilated via an ETT. She subsequently developed abdominal distension due to intra-abdominal bleeding with a fall of haemoglobin from 100 to 53. She was transfused and because of her unstable and serious condition was transferred to tertiary hospital ICU. On arrival at ICU (day 3 after initial surgery) she was unstable with evidence of ongoing intra-abdominal bleeding. She was resuscitated with appropriate blood products but continued to bleed and was given recombinant factor 7a, after which her bleeding appeared to settle somewhat. Laparotomy was performed by an SR and consultant and 3 litres of intra-abdominal blood was removed but no obvious site of ongoing bleeding was discovered. She returned to ICU and had a protracted difficult course complicated by acute renal failure requiring dialysis, chest infection (possible due to aspiration) and complex antibiotic therapy.

She was returned to theatre on day 14 after her initial surgical procedure for evacuation of a large rectus sheath haematoma which had caused a further falling haemoglobin necessitating transfusion. A surgical tracheostomy was placed at this time. She had no further bleeding, but had problems with renal function and sepsis. Nineteen days after her initial surgery, she had a further change of right internal jugular vein central venous line (right side) and two hours later she suffered a right tension pneumothorax requiring a right intercostal catheter. Despite initial improvement she developed a recurrent right tension pneumothorax and shortly after a left tension pneumothorax in the presence of severe surgical emphysema of the upper thorax and neck. Despite bilateral intercostal catheters and airway interventions, she was unable to be ventilated satisfactorily, failed to improve and was pronounced dead a few hours later, on day 20 after her original hysterectomy. Post mortem did not define why she had died.

COMMENT

This young woman died tragically from complications of a routine abdominal hysterectomy performed for menorrhagia. The initial complication was presumed to be a massive pulmonary embolism, which seems likely as no other cause for her collapse can be deduced. The decision to give a full loading dose of 1.5 million units of streptokinase could be criticized as this therapy given shortly after major surgery can be complicated by life threatening haemorrhage as it was in this case. However, faced with a collapsed woman in dire straits, this decision and therapy would appear reasonable. It should be noted that this dose is that recommended for

acute myocardial infarction. The dose recommended for lysis of pulmonary embolism is 250,000 units iv over 30 minutes. However, I am advised by an ICU colleague that a loading dose of at least one million units would be usual in a case of life threatening pulmonary embolism.

This woman was at moderate risk for thromboembolism. It is recommended that the oral contraceptive pill be ceased at least four weeks prior to major surgery and thrombo-prophylaxis be used perioperatively. Unfortunately she continued her pill until the day of surgery (for no obvious reason) and did not commence her heparin prophylaxis until nine hours after completion of her surgery. She was given TED stockings. Whether this delay in commencing heparin or her preoperative oral contraceptive therapy contributed in some way to her pulmonary embolism will never be known. It is always possible to be wise and very clever after the event!

The timing of her collapse due to presumed PE was unusual, and it is possible that she had already developed some form of pelvic vein thrombosis prior to her operation related to other factors, and her fate was 'written in the stars'. The initial resuscitation at the regional hospital was excellent and well documented. The decision to transfer from a regional to a tertiary centre ICU was appropriate. The care at the tertiary level ICU and from the treating surgical team at that hospital was exemplary.

Despite complex intensive care she ultimately developed bilateral pneumothoraces and gross surgical emphysema of the upper thorax and neck, some two hours after change and reinsertion of a right internal jugular CV line. While placement of this line was satisfactory (according to post mortem findings) it seems likely that this intervention did in some way provoke her pneumothoraces which ultimately led to her unsatisfactory pulmonary ventilation and her death.

Although the post mortem in this woman did not explain why she died it is important to secure a post mortem whenever death is sudden or unexpected and even in circumstances where death is expected, it may be of use, if only to exonerate the treatment team. In conclusion it appears that her final event from which recovery did not occur was bilateral pneumothorax possibly related to insertion of a central venous line, which may have been preventable. The initial catastrophic complication of presumed pulmonary embolism may not have been preventable, but attention to detail in regard to prevention of thromboembolic disease is crucial and could possibly have been improved in this woman.

Management of pseudo- obstruction

SUMMARY

- "Pulmonary embolus" of a young patient
- Disabled patient with previous history of colonic pseudo-obstruction

- Presented unwell with gross abdominal distension
- Initial temperature 36.5c, heart rate 120, SaO₂ 91%
- Rigid sigmoidoscopy unsuccessful
- Percutaneous needle decompression of colon provided improvement
- T = 38.9c, HR 130 @ 0700 " more distended, restless"
- Nurse stated concern to night RMO at around 0745 but no medical staff had attended by 0830 and patient was found dead at 0900

COMMENT

Areas of concern:

1. The patient was initially afebrile, but became increasingly unwell overnight and febrile nine hours following a needle decompression of the distended large bowel. Percutaneous needle decompression of a distended colon would be a most unusual mode of treatment, with a high risk of bowel content spillage into the peritoneal cavity and subsequent peritonitis. This form of treatment is not mentioned in an editorial of the 'management of pseudo-obstruction' published in the NEJM, 341(3), July 1999. There is a case report involving percutaneous needle decompression for pseudo-obstruction (Chevalier, Am J Gastrent, 97(2), Feb 2002) but importantly this involves nylon T-fasteners to attempt to anchor the bowel to the abdominal wall and prevent leakage. I would be concerned the needle decompression in this case may have resulted in peritonitis and may have played a significant role in the patient's death. I do not understand why colonoscopic decompression was not attempted, as commonly recommended.
2. There appears to have been poor communication between the night and day RMO at shift change over, with a nurse voicing concern for the patient, but no subsequent RMO review for over 90 minutes in a critically ill patient.
 - DVT prophylaxis: appropriate
 - Death Certificate: no indication of pulmonary embolus clinically documented despite being the stated cause of death

RECOMMENDATIONS

I understand this patient had a poor quality of life making the case difficult, but believe two important learning points need to be addressed.

1. Clinical pathways be developed and an educational meeting on the management of pseudo-obstruction be held. Percutaneous needle decompression for distended large bowel should be discouraged.
2. Hand over between shifts should be examined to improve communication and prevent delay in the ongoing care of critically ill patients.

Possible preventable death from ischaemic bowel

SUMMARY

A 78 year old lady presented to the emergency department with left chest pain three days following a fall onto her abdomen. This fall had been associated with a fractured elbow for which an ORIF had been booked. Since the injury, the pain had been increasing requiring oral panadeine forte and endone. She also complained of epigastric pain. On examination pulse 96, BP 114/77, 5A02 93%, abdominal examination tenderness and rebound noted in the epigastrium.

Investigations: Abdominal x-ray showed faecal loading, ABG's showed a P02 of 50. Lactate was at the upper limit of normal. Initial management included intravenous morphine. Reasonably a splenic laceration was suspected but a CT scan arranged to look for the cause of shock without surgical consultation. This showed a fractured sixth left rib and bilateral lower lobe consolidation. Ten hours later the patient was admitted to the ward and noted to be drowsy, increasingly tachycardic, hypotensive and febrile and still significantly hypoxic despite 15 litres of oxygen. The patient was treated with oral lactulose and glycerin suppositories. Just over 12 hours after admission an RMO was called to review the patient who was sweaty and clammy with cool peripheries, markedly hypotensive and tachycardic and in atrial fibrillation. The patient was treated with one litre of normal saline and subcutaneous morphine. The registrar reviewed the patient one hour later and ordered further intravenous fluid, resuscitation and considered transferring the patient to the Coronary Care Unit. Later that evening the patient was noted to be increasingly unwell and oliguric. Repeat arterial blood gases showed an uncompensated metabolic acidosis. White count was 18.9 and lactate 3.8. These results were apparently discussed with a physician consultant who thought the diagnosis was either likely to be a pulmonary embolus or an acute coronary syndrome. The patient was eventually transferred to the Nurse Specialist Unit where ongoing signs of shock were present. The patient was treated by intravenous heparin and dopamine and intravenous antibiotics. The consultant physician was phoned again and requested an ICU review. The following morning the consultant physician reviewed the patient and noted her to be extremely unwell and considered the diagnosis of ischaemic bowel. He suggested the CT scan be reviewed by a radiologist. The final CT report suggested early right sided colitis. The patient was eventually transferred to the ICU and a general surgical opinion requested. The registrar arranged an immediate laparotomy at which a gangrenous colon was found and the patient treated by subtotal colectomy with end ileostomy.

On return to the ICU the patient was moribund with a pH of 7.01 and a lactate of 14 and very high inotrope requirement. She developed progressive multi system organ failure and died 36 hours later.

COMMENTS

In retrospect there appears little doubt that this patient's presentation was due to ischaemic bowel. The fact that her presenting complaint was left chest pain clearly clouded things. However, she was noted to have significant epigastric pain and peritonism on presentation.

This patient clearly had signs of shock at admission and this progressed during the day. Whilst this diagnosis was vaguely referred to in the notes a few times, it was clear that the significance of this diagnosis was not appreciated nor appropriately managed for over 24 hours following admission. A number of differential diagnoses were considered, perhaps the most significant was that of pulmonary embolus which was treated by eventual intravenous heparinization, but no attempt made to confirm the diagnosis.

Within 12 hours of admission the lactate was noted to be 3.8. This would normally trigger an urgent surgical consultation which did not happen. In retrospect at this stage the diagnosis of ischaemic bowel was obvious.

The surgical management of this patient was timely and appropriate and could not be faulted. I believe this hospital has a medical emergency team. I am not aware of the exact criteria for a MERT call, but suspect this patient would have met a number of these on at least one occasion whilst on the ward.

There is no record in the notes of this critically unwell patient being reviewed by a consultant for over 24 hours following admission. As soon as the patient was reviewed by a consultant who recognized that she was critically unwell and considered ischaemic bowel as a possibility but did not seek a surgical opinion. It is also concerning that the patient was reviewed twice during the night by an ICU registrar who considered the current management on Nurse Specialist Unit appropriate. There is no record of discussion with a consultant intensivist which at this stage could well have led to an earlier admission to ICU and surgical input.

Whilst ischaemic bowel carries a considerable mortality in this age group, there is good reason to suspect that this patient may have survived if the patient was admitted to ICU and laparotomy was performed within 12 hours of admission.

It was assumed that once the CT scan of the abdomen was "normal" this excluded an intra abdominal problem.

It would be worthwhile presenting this case to our physician colleagues who infrequently deal with ischaemic bowel and shock to demonstrate this point.

Death from small bowel obstruction related to incarcerated hernia

SUMMARY

A 74 year old man with both Parkinson's disease and Alzheimer's disease, but who coped at home with support of his wife, presented slowly deteriorating in cognitive function, a number of falls, followed by a significant bout of vomiting, which included "coffee grounds". This commenced six days before admission to hospital.

It is not clear from the notes whether the diagnosis of a small bowel obstruction had been entertained prior to admission at the hospital. Certainly it was immediately noted by the emergency staff who found him to be shocked and tachycardic with a silent guarded abdomen consistent with peritonitis. This was however not complicated at that stage by respiratory deterioration, as his saturation on admission was 96% and his respiratory rate normal.

He had various support manoeuvres and investigations. There was only one recorded set of observations in the chart for during the time this man was being resuscitated. However the chart discussing his level of risk scored him as high risk for peri operative difficulties. I would wonder however of the choice of 5% dextrose as a resuscitating fluid initially in the Casualty service, but perhaps his mental state caused some consideration of worry that he may have a low blood sugar, but it is a poor resuscitative fluid. He was transferred to the care of the Anaesthetist and appropriate Hartman's solution was instituted. The total of fluid resuscitated seemed quite low considering the presentation however. Nonetheless he went to theatre with a normal blood pressure.

It is interesting that prior to theatre he spent some time in a medical ward, which seems possibly less appropriate than a surgical ward for a sick pre-operative patient. And indeed he was incontinent of urine, yet was not catheterised at this stage to look at resuscitative effort. I think that a fluid balance of strict nature was important and exacting in a patient of this criterion.

The notes from the consultant surgeon, who arrived four hours after assessment and admission recorded an incarcerated and probably gangrenous small bowel obstruction, from tracking of small bowel loops in the right iliac fossa.

This was promptly declared to be urgently operative, and within less than an hour the patient was operated on. I cannot fault the assessment by the surgeon of the patient, nor the operation.

The operative notes describe the resection of several gangrenous segments, locked in the hernia. This was done from the hernia wound, which is an acceptable method. The patient's pathology does report that the entire gangrenous bowel was removed, and it was full thickness gangrenous bowel. Once it was released from the hernia there is always a trend towards septicæmia as evidence by the pulse rate, the blood pressure chart, and the temperature on the succeeding day after

operation.

He was returned to the ward at 0850, which was not a long operation and recovery period for this procedure, clearly exuviated.

By lunch time on the second post operative day the patient showed evidence of hypotensive shock with respiratory impairment and deteriorating oxygen saturation. Chest x-ray was performed showing some opacity in the right lung field as well as minor in the left. It was not entirely clear that this was aspiration, but consistent with a deteriorated level of consciousness, this is always a problem.

He had not been fed post operatively apart from a few sips, but there was no nasogastric tube decompressing his bowel. He did spike a fever on that day consistent with ongoing sepsis. He was on appropriate antibiotic cover, and when the chest problem arose the patient was again placed on something to cover this as well at correct dosage.

It is noted that his resuscitation after day one was effective, he had a change in his urea from high to modest, but when he became ill again this rose further. I think he was well resuscitated intra operatively.

It is likely that the pathology is one of two things which caused his death. That is aspiration pneumonia, as a potential, or secondly simply septicæmia from mobilisation of the gangrenous loops, which is a known complication.

He was given adequate support, and the notes fully convey this. He was seen by a number of doctors post operatively, but it reads like appropriate management was maintained, and good rapport with the family also instituted. I find the record keeping easy to understand and see that there is no problem with the admission system to the hospital.

I believe the areas of comment are simply for consideration only. I think he spent six days outside hospital prior to be admitted during that time it is clear his wife had commented on him having vomiting and falls, as well as not having opened his bowels. He had nasty vomiting thereafter. Yet there is no record in referral letters of examination of his hernias.

It is a long delay to expect a man of this age to survive a gangrenous bowel obstruction, and the peritonitis unfortunately had occurred prior to hospitalisation. The delay in diagnosis cannot be placed on the hospital, but prior to admission.

My only other thought which again is simply for consideration, is the resuscitative measures initially, which included the use of 5% dextrose, and no urine catheter in a clearly doubly incontinent man. In preparation for theatre, which clearly requires a period of resuscitation there was no delay.

Missed diagnosis of small bowel ischaemia leads to delay and death

SUMMARY

An 81 year patient was admitted into a small country hospital for respite care while her daughter was away on holiday. There was a background history of chronic atrial fibrillation, managed with digoxin and warfarin, congestive cardiac failure and NIDDM. Three days prior to her transfer to a private city hospital she developed a rapid atrial fibrillation with a heart rate of about 150/minute, as compared to her usual rate of about 80/minute. She also developed abdominal pain, some diarrhea and had passed a streak of blood in her stool. On admission to the private hospital she was noted to have a white count of 20,000, CRP of 200 and an abdominal x-ray showing dilated loops of bowel with multiple fluid levels. She was transferred to a tertiary hospital for surgical review.

The surgical review noted that her abdomen was soft, tender in the left upper quadrant, but with no signs of peritonism. There is no record that bowels sounds were listened for. Her CRP was now 270 and the diagnosis of ischaemic bowel was considered. A CT of her abdomen showed several thickened loops of proximal to mid-jejunum with normal bowel seen proximal and distal to this. The differential diagnosis suggested included ischaemia infection/ inflammation. She was reviewed again by the surgical team after this CT and it was once again noted that her abdomen was soft, she was mobilising in and out of bed easily and in view of the fact that her INR was 1.9, ischaemic bowel was thought to be quite unlikely. She was also noted to have a digoxin level of 1.5 and the possibility that this was a digoxin toxicity was raised.

She was then transferred back to the private hospital. This transfer was in the early hours of the morning and she arrived back at the private hospital at about 0400. She was reviewed at 0900 in the private hospital where she was then seen by a consultant physician who said that she had most likely small bowel ischaemia and she was sent back to the tertiary hospital for further surgical review.

She was seen again at the tertiary hospital where the diagnosis was made of infarcted small bowel and she went for a laparotomy at which the small bowel was noted to be infarcted over almost its entire length. It was considered to be inoperable and no surgical procedure was performed. She died three days later.

COMMENT

I think that it is rather ironic that a trainee GP in a small country hospital made the diagnosis of ischaemic small bowel and quite correctly transferred the patient to a metropolitan hospital. She was then reviewed by a surgical team in a tertiary hospital with the advantage of a CT scan which again strongly suggested ischaemic small bowel as the diagnosis, and yet this was disregarded. Ischaemic small bowel is a diagnosis which is notoriously difficult because the symptoms and signs are often at variance. Nevertheless, this 81

years old patient with atrial fibrillation, abdominal pain, a positive CT scan for ischaemic bowel was sent back to the private hospital. Clearly, there were some red herrings. Namely that she was already on warfarin with an INR of 1.9 which would clearly reduce the risk of embolic problems, and she also was suffering from Digoxin toxicity perhaps, but I would have thought it would have been a more reasonable option when she was in the tertiary hospital to admit her and have her assessed by a consultant surgeon in the morning, a matter of a few hours away.

73 year old gentleman admitted to the Gastroenterology Unit seemingly with abdominal pain, vomiting for two days, and with constipation.

This man, who was a smoker had a family history of cancer with one sister having bowel cancer who died and an uncle who had stomach cancer. He underwent a screening colonoscopy and was found that he had a carcinoma in the transverse colon. It was also noted that the previous day he may have had chronic atrial fibrillation and it was recommended that he undergo an echocardiogram.

The patient was seen by the surgical team and it was decided that he should go to theatre fairly promptly. It was noted in the post-operative period that he was hypotensive and that there was poor urinary output. An epidural catheter had been inserted. It seems the infusion rate had been decreased in view of the hypotension and decreased urine output. It appears from observing the notes that there is good documentation of the patient's progress and there appears to have very regular attention by medical staff and nursing staff with good record keeping.

It was noted two days after surgery that the nasogastric tube could be removed. It appears that he gradually developed pulmonary consolidation and effusion, and the next day it was noted that there were bilateral pneumothoraces and fluid was found in both chest drains when they were inserted bilaterally. It would appear that the patient died 32 hours after this incident. It appears that the family had been very well counselled by senior staff and the intensive care consultant did talk to the patient's relatives on the 24th June. A repeat laparotomy was performed and there was no major intra-abdominal problem seen.

COMMENTS

I wonder whether the surgery might have been slightly premature in the sense that there are no comments made about the hydration status of the patient, whether it was discussed with the Consultant by the Surgical Registrar, and whether an echocardiogram should have been done prior to surgery.

There is perhaps not a lot of comment about the suspected oesophageal perforation. It might have been worthwhile to consult thoracic surgery about this perhaps even consider an oesophagoscopy at the time

of the repeat laparotomy, and even perhaps some contrast studies could have been considered if endoscopy was not embarked upon. It appears that there has been appropriate use of DVT/PE prophylaxis with Clexane being used. I noted a post mortem has not been recorded and may not have been done.

The case does appear to adhere to a reasonable care pathway. Some areas of concern might be the overall medical fitness prior to surgery of the patient, the hydration status, and need to an echocardiogram could have been commented on even if not done. It also might have been worthwhile to formally decide whether there was perforation of the oesophagus. This might have been managed perhaps even with a stent or at least it might have given further definitive information as to the cause of the presumed pulmonary decompensation and septicaemia experienced by the patient. Overall, the care and reporting and information given to the family of this case appears to be of a good standard. I have commented that there may have been three areas of concern in view of these factors. I think the pre-operative preparation was an area of consideration and I think the oesophageal perforation was an adverse event.

Beware the 'virgin' abdomen

SUMMARY

An 86 year old woman presented to an emergency department on a Sunday morning. Her history was of sudden abdominal pain and nausea at 0300. She was noticed to be dehydrated. Abdominal x-rays on the Sunday morning showed multiple small bowel gas fluid levels, but some gas was also present in the colon. No records were kept in the emergency department notes, but she was admitted to the ward by 1130 the following day. She was given intravenous fluids and strict fluid balance chart for urine output was ordered, but no IDC inserted. An abdominal CT scan was ordered, but delayed until 1815 hours on the Monday. Prior to this, it was noted that no flatus had been passed. The CT scan confirmed the presence of a small bowel obstruction and noted that some contrast had passed into the colon. The decision to laparotomy was made, but delayed until 2200 hours, presumably due to unavailability of theatres or staff.

At laparotomy, a banded adhesion from the tip of the greater omentum to the post vaginal hysterectomy site was found entrapping a large loop of necrotic small bowel. Approximately one metre was resected. The patient could not breathe on extubation and so was re-intubated and admitted into ICU.

A chest x-ray in the ICU taken one day post operatively showed the ETT lodged in the right main bronchus. The duration was unknown, but later estimated to be about 15 hours. On the second post operative day, her surgeon reported that the patient's condition stable on two separate occasions. On the afternoon of the following day, she was extubated in ICU, discharged to the ward after four hours of observation where she

arrived after 6pm with no notification of the surgical team. She was transferred to HDU. A MET call was placed at 2200 hours when she was found semi comatose. She did not respond to resuscitation and died.

COMMENT

Her hysterectomy, presumably vaginal, was recorded in the Ambulance patient case record on her admission and also on her anaesthetic record for ophthalmic surgery undertaken two years previously. There was no mention of hysterectomy in her inpatient notes on the admission prior to her death. In fact, two entries noted the absence of abdominal scars and later describing her as having a 'virgin' abdomen.

Had this patient's abdomen been opened on the afternoon of her admission she may have had a chance of survival. The diagnosis was by then available from her x-rays, ie small bowel obstruction from whatever cause. The 'virginal' abdomen was a confounding piece of information interfering with the surgical 'will' to solve an acute abdominal problem. It could have been avoided by adequate history taking sourced from the patient, relatives or previous records. Thus, the CT scan thought necessary, but delayed by interdepartmental communication failures until 1815 hours the following day may not have been required. Once made, the actual operation was delayed until 2200 hours, now 43 hours since the onset of her acute abdominal pain at 0300 hours one day after admission, as recorded by Ambulance records.

Her surgery was successfully accomplished but approximately one metre of bowel had to be resected.

In ICU she was ventilated on one lung only for about 15 hours.

There has been a drift away from the attitudes of a former surgical era which contributed to this patient's demise. In the elderly it is better to 'look and see rather than wait and see'. People in the ninth decade do not have the resilience in their bowel to withstand such an insult for 42 hours without translocation of intestinal bacteria and endotoxins occurring. A younger person might have survived without the early development of SIRS and later multi organ failure.

Interdepartmental communication failures between the surgical team, diagnostic imaging department and ICU are very obvious contributions to the delay and work is needed to break down the 'island attitudes' sometimes prevailing in tertiary institutions.

Finally, the intubation of the right lung only in ICU is a mistake that indicated inexperience in ICU observation, as it is the most likely adverse event to be associated with a ventilated patient.

Laparotomy may have changed outcome of patient after CABG

SUMMARY

An elderly man with a long history of atheromatous disease presented with unstable angina. He was unsuitable for percutaneous intervention and was referred for CABG surgery.

He had very severe coronary artery disease and poor left ventricular function. He had a past history of peripheral vascular disease with bilateral iliac artery stents. To reduce the risk of death from his CABG operation an intra-aortic balloon pump was inserted pre-operatively. The operation went well and he was weaned from bypass easily. He maintained good haemodynamics post-operatively on minimal inotropes until the next day. He then developed a progressive lactic acidosis which was quite disproportionate to his general perfusion status.

The question of ischaemic bowel was raised and the general surgeons consulted. They, on the basis of a CT scan and their clinical view, refused to perform a laparotomy. The patient's condition continued to deteriorate and he died in multiorgan failure two days post operatively.

Post mortem examination showed ischaemic colon with mucosal abscess formation.

COMMENT

This was a high risk patient for CABG surgery due to his age and severity of coronary disease and poor LV function. Appropriately, an IABP was inserted preoperatively. Post operatively his heart functioned well, but he suffered from ischaemic gut. This was suspected by his ICU doctors, but they were unable to convince the general surgeons to perform a laparotomy. The multiorgan failure which followed caused his death. I consider that if a bowel resection had been performed when the question of ischaemic gut was first raised, then the outcome may have been different. I consider that the surgeon performing the CABG was let down by another surgical team.

Inadequate medical input to multiple problems

Overall the medical record was difficult to examine because a number of forms were not dated and it was impossible to determine the status of people who made entries in the progress notes.

CLINICAL SUMMARY

This 82 year old nursing home resident was frail, dependent on a frame, had very high blood pressure, was incontinent of faeces and had multiple comorbidities. She could be described as having reached the end of her life span. She was admitted to hospital with a diagnosis of a fracture of the left proximal femur, by ambulance. She had fallen and hit her head. X-rays of the wrist performed the next day showed a distal radius fracture. In the emergency department she was examined, catheterised, x-rayed, given analgesics and anti-coagulants (clexane). She was admitted. The process was clear and thorough. The decision to give clexane should be reviewed. She was seen by the orthopaedic registrar the same day. He conducted a reasonable assessment. No mention of wrist fracture was made though a plan to X-ray the wrist was made. The orthopaedic consultant was notified. Surgery - compression screw fixation and manipulative reduction under image intensifier control - was carried out two days after admission. The anaesthetic record shows the duration as 2hrs30mins with two episodes of relative hypotension during surgery. It is possible that the clexane may have caused additional bleeding during surgery and that this was responsible for the episodes of hypotension and the final acute renal failure. Post-operatively there is repeated documentation of a decrease in urinary output and one note that the patient was complaining of chest pain. She was seen by someone whose status is unclear. The evaluation of the potential causes of the low urinary output is non-existent. At 2200 hrs a doctor was notified of the continuing problems, but declined to attend. The Medical Emergency Team was called out one day post-operatively because the patient had a low BP and a low O₂ saturation. She died soon afterwards. The exact cause of death is not clear.

COMMENTS

There was no evidence of involvement by the orthopaedic consultant at any stage. The medical response to the post-operative oliguria seems inadequate. There is no evidence of any input from anyone who understood the complexities of geriatric physiology in the post-operative phase. The letter to the general practitioner following the death of the patient was totally inadequate.

While in all likelihood the death of this lady was inevitable I was left with the feeling that she was treated with a degree of indifference that I find disquieting. It is important to determine whether there was excessive bleeding at the time of surgery as the clexane may have contributed this patient's death.