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Feedback

Surgical Safety Update: Cases from the Confidential Reporting System for Surgery (CORESS)

CORESS is an independent charity, supported by the Federation of Surgical Specialty Associations (FSSA)
Professor Frank CT Smith, Programme Director, on behalf of the CORESS Advisory Board.

This series of reports illustrates cases from several surgical specialties, emphasizing common themes across the practice of surgery. Lessons with respect to reviewing ordered investigations, communication between surgical teams, dealing with technical problems, and the need for early recognition of the patient who fails to respond following intervention, can be drawn.

We are grateful to those who have provided the material for these reports. The online reporting form is on the website (www.cores.org.uk), which also includes all previous Feedback reports. Published cases will be acknowledged by a Certificate of Contribution, which may be included in the contributor's record of continuing professional development, or may form part of appraisal or annual review of competence progression portfolio documentation. Trainee contributions are particularly welcome.

Professor Frank CT Smith
On behalf of the CORESS Advisory Board

PICC line fracture on removal

(Case ref: 255)

A 65-year old man had been treated successfully for a pelvic sarcoma over 5 years. He had required placement of three successive long-term venous access lines during that period, for chemotherapy. The last PICC line (Peripherally Inserted Central Catheter) had been placed in-situ by a left ante-brachial route, into the left basilic vein and thence centrally, and was currently redundant. The oncology service had planned removal of this line so the patient could go swimming. When the oncology team met resistance whilst trying to remove the line, the on-call vascular team was asked to help. An experienced vascular surgeon attended and removed the line, perhaps with a little more force than the oncology team had deployed.

The next day the patient complained that something did not "feel right" and that he had felt a "snap" when the line was removed. Imaging confirmed the presence of the distal residual line which had broken off when the 6F gauge catheter was removed. Since the patient was asymptomatic, the decision was taken to leave the fractured line tip in place.

Reporter's comments:

- (1) If a PICC line cannot be removed in the standard fashion, further attempts to remove via the insertion site with increased traction should not be attempted.
- (2) PICC lines should only be removed by clinicians familiar with the devices.
- (3) Patients should carry information with them about the invasive device; lines should not be removed without reference to this.
- (4) If a line is stuck, and cannot be removed this should be discussed with interventional radiology and image guidance employed. This may reveal why the line is stuck. Various radiological techniques including retrieval of the line over a guidewire, or use of an endovenous snare may then be deployed.

CORESS comments:

- When removing a PICC line, it is useful to know how long it is. Imaging is required to check this. Check that it is intact on removal. Some lines will have a black marker at the tip.
- Vein spasm may contribute to difficulty in removal. Warming the arm for a few minutes may venodilate, facilitating removal.

Unnecessary Block Neck Dissection

(Case Ref: 256)

A 40 year-old man – a smoker, attended his GP with a four week history of a lump in the right side of his neck. The GP described "throat and ears clear, lymph node 5cm x 7cm at right anterior angle, not fixed, non-tender, feels cystic, freely mobile, chest clear". The patient was referred to ENT, who arranged FNA of the lesion. FNA cytology showed "atypical squamous cells and a background of inflammatory cells and cellular debris". This report was confirmed by three cytologists.

CT scan of neck and chest, pan-endoscopy and right tonsillectomy were performed. On CT the observed mass was described as a 2cm x 2cm x 3cm right level II lymph node mass, with retropharyngeal and jugulodigastric nodes of "uncertain significance". Chest and abdomen CT scan "no significant abnormality". The tonsil histopathology report stated "hyperplastic, no malignancy".

The patient was discussed at a Head and Neck MDT with a referring comment that, "despite pan-endoscopy and right tonsillectomy, primary has not been found". The MDT minutes did not list attendees. The resultant plan was: "Right neck dissection in the next few weeks with post-operative radiotherapy, with or without chemotherapy".

The risks indicated on the consent form, signed by the patient, were "bleeding, scar, nerve damage".

The operating note indicated that the surgeon was a senior trainee and stated: "Modified radical neck dissection, accessory nerve preserved".

The histopathology report on the operative specimen was: "Lesion 35mm x 20mm x 15mm, contains cystic pus-filled cavity. Microscopy: branchial cyst with squamous lining. No evidence of metastatic squamous cell carcinoma within a total of 20 lymph nodes examined".

The out-patient follow-up letter dictated by the operating surgeon stated: "I have explained to the patient and his wife he does not have cancer. The operation that he has had has removed the branchial cyst. No further treatment is required". The patient was left with chronic neck pain which had a significant effect on his earning capacity as a labourer.

CORESS & Reporter Comments:

1. Although the FNA specimen was considered by three cytopathologists, such reports are unsuitable for evaluating the presence of invasion and discriminating between certain benign and well differentiated malignant neoplasms. Cytology in the best hands has a 10-20% error rate.
2. Pre-operative investigations, pan-endoscopy and tonsillectomy were negative for malignancy. In this situation the proper course of action mandated by the MDT would have been to remove the primary lesion with intra-operative frozen section analysis. There would have been the option to continue to block neck dissection if malignancy was confirmed. Any frozen section histopathology report, other than confirmation of an invasive squamous cell lesion requiring continuation to block neck dissection, should have halted the operation procedure at the local excision point and awaited subsequent confirmatory histopathology on paraffin sections.
3. The MDT meeting notes were inadequate. There was no list of attendees and no mention of a differential diagnosis, or who proposed the block neck procedure and whether there was concordance with this approach. This complex case management was undertaken by a trainee without comment from the responsible Consultant in the documentation. Duty of Candour regulations were not observed.





Mismanagement of abdominal trauma

(Case Ref: 257)

A 14 year-old girl fell from her horse at a Saturday afternoon gymkhana. The horse stumbled and trod on her abdomen. The attending ambulance technician recorded "complaints of pain to abdomen; on examination - rigid and guarding, hoof print to abdomen, pain suprapubically". The hoof print trauma sign was confirmed on arrival at A&E. The girl was seen by a surgical Registrar who arranged immediate CT scan of the abdomen and pelvis. This was reported as showing "no evidence of any contused bowel loops or intra-abdominal pelvic haematoma, no pelvic fracture". The child was admitted under the paediatricians.

At 22.00, she vomited blood. The paediatric Registrar reviewed the child and prescribed intravenous Ranitidine and Ondansetron, recommending that she could "eat and drink as comfortable/tolerated". This opinion was supported by the junior surgical team. No Consultant involvement took place overnight.

At 09.00 the following morning her pain score was 9/10 and respiratory rate 35. On the post-take ward round by a Consultant Paediatrician she was noted as having "bouts of excruciating pain every 2-3 minutes, relieved by Paracetamol and codeine". An F2 doctor then prescribed Oramorph. She was not seen by a Consultant Surgeon.

In the next 12 hours nurses encouraged her to drink and mobilise. They told the parents that the scan was normal and the girl was "making a fuss". On the following morning, 46 hours after injury, she complained of blurred vision. Nurses continued to encourage oral intake. However, half an hour later she collapsed. After rapid resuscitation she was taken to theatre where a two thirds laceration of the 4th part of the duodenum, with 3 litres of free fluid in the abdominal cavity, was identified. Post-operatively she was intubated, ventilated, and transferred to a paediatric ITU where she remained for 11 days. She required multiple antibiotics, anti-fungal agents, and drainage of a pleural effusion. The original laparotomy wound had to be debrided and left to heal by secondary intention. This took four months. The patient subsequently had episodes of subacute intestinal obstruction. She was off-school for six months.

Reporter's Comments:

- 1. Mechanism of injury: This should have alerted the admitting team. Consultant review on admission was mandatory. Haematemesis post-trauma should have resulted in immediate Consultant Surgeon review and laparotomy.
2. Treat the patient - discount scans which are contrary to observations.
3. The case highlights potential danger of non-surgical observations on a paediatric ward. Analgesics may camouflage progressive symptoms.
4. Believe and act on the evidence of trained paramedics in their assessment of emergency cases.

CORESS Comments:

The Advisory Board agreed with the reporter's comments, and that the patient should have been admitted under the surgical team. Initial and subsequent assessments should have involved a Consultant Surgeon and regular reviews should have been undertaken.

Missed pulmonary malignancy

(Case Ref: 258)

A 59 year-old man with a long history of smoking, dyspepsia and Barrett's oesophagus, presented to his GP with a sore throat, an altered (bovine) cough but no dysphagia. Throat examination by the GP was normal. Based on the smoking history, a chest x-ray was undertaken and reported as normal. The patient was referred without delay to an ENT surgeon who confirmed a left vocal cord palsy. MRI scan of the neck and CT scan of the chest was arranged. The MRI scan was normal; CT scan showed an enlarged left lobe of thyroid causing mild tracheal shift and "a 6mm sub-pleural soft tissue nodule in the apex of the left upper lobe of the lung". The reporter stated that "a small pulmonary metastasis cannot be excluded".



The patient was subsequently seen by a maxillo-facial surgeon at a different hospital because of temporo-mandibular joint problems. He stated in a letter that he did not have access to the x-rays. The patient was then seen by a neurologist because of his voice change. This Consultant planned an MRI scan of the brain. The original ENT surgeon decided to refer the patient to an endocrinologist who confirmed a large multinodular goitre and referred the patient on to another Consultant ENT Surgeon.

Six months after the initial presentation with vocal cord palsy, the second ENT Consultant recommended thyroidectomy, which was performed. The recurrent nerve was "not seen to be specifically compressed or stretched. The nerve was preserved".

Histopathology revealed a benign multinodular goitre. The ENT surgeon planned to review the patient six months later and to consider a bioplastic injection into the paralysed vocal cord. However, blood tests at this time showed abnormal liver function tests. Notwithstanding this, the patient was taken back to theatre for microlaryngectomy and injection and medialization of the left vocal cord.

The patient was at this time referred for a cervico-thoracic MRI scan because of upper thoracic pain and longstanding scoliosis. An incidental finding was an irregular left-sided pulmonary hilar/mediastinal mass, lung cancer staging T4 N3. Endobronchial ultrasound and biopsy confirmed a non-small cell lung cancer. The patient was commenced on palliative chemotherapy and radiotherapy. He died of progressive carcinomatosis two and a half years after his initial presentation with a hoarse voice.

Reporter's Comments:

- 1. The original chest CT report was ignored/missed by the ENT Consultant.
2. In the first year after presentation to his GP, who had concern about the possibility of lung cancer, this patient passed through the hands of seven teaching hospital Consultants, none of whom made the link between a bovine cough and recurrent laryngeal nerve infiltration by left bronchogenic carcinoma. Two anaesthetists took the patient to theatre for benign conditions when he had an enlarging left upper lobe carcinoma, which might have been apparent on auscultation.
3. This case illustrates the downside of ultra-specialisation. The failure to review all antecedent history and imaging at different clinics as the patient was moved between different hospitals in a single Trust may have contributed to the premature death of this patient.

CORESS Comments:

There was a disconnect between review of the medical evidence and the classic clinical presentation of recurrent laryngeal nerve invasion by a pulmonary neoplasm. The Board felt that the reporter's criticism of the ENT surgeon was harsh, but that the case should have been flagged for review by a respiratory MDT, when the original comment concerning the pulmonary nodule, seen on CT, was made. The dangers of failing to follow up all investigations, when a patient is handed between specialists, are apparent.

Missed opportunity to intervene for critical ischaemia

(Case Ref: 259)

A 72-year old man was seen by the on-call vascular Consultant in an on-call "Hot Clinic". The patient had been referred with a dry gangrenous toe of 4 weeks duration, rest pain and a history of peripheral vascular disease for which he had previously undergone femoro-popliteal bypass. The Consultant undertook a duplex scan and booked an urgent CTA. Since the patient had come to hospital un-prepared for admission, and his symptoms had been unchanged for a considerable period, the Consultant allowed the patient to go home from the clinic on that day, and wrote to the vascular waiting-list coordinator requesting urgent admission for review and toe amputation.



In the interim, there were administrative delays to the admission, which were not communicated to the Consultant. The patient's admission was finally prompted 18 days after the Hot Clinic appointment, by a call from the GP who was concerned about deterioration in the patient's condition. At admission, there had been progression of ischaemia and development of forefoot sepsis. CTA confirmed occlusion of the previous bypass graft and a revision bypass was undertaken which occluded within 48 hours. The patient eventually required below-knee amputation.

Reporter's Comments:

The patient had evidence of critical ischaemia, albeit of long-standing duration, when he was seen in the "Hot Clinic". Irrespective of the logistical difficulties, a CTA should have been obtained urgently on that day, the results reviewed by the on-call surgeon, and admission probably should have been arranged on the same day. In the event, delays ensued which were not communicated to the on-call Consultant who by that time was "off-call" and undertaking his routine daily practice, and the patient's admission slipped through the net. It is possible that the outcome of BKA may have been avoided had intervention been undertaken more expeditiously.

Critical ischaemia is never a benign condition and may deteriorate suddenly and rapidly, particularly if sepsis ensues. Early assessment of inflow and perfusion is essential to determine whether revascularisation is feasible.

Whenever an investigation is ordered, the requesting physician has a duty of care to review the outcome of that investigation as soon as possible.

CORESS Comments:

The Advisory Board agreed with the reporter's comments. A clear protocol for dealing with acute cases requiring intervention in the "Hot Clinic" might have reduced the risk of the patient's delayed admission. Formal on-call handover of a list of all outstanding patients would have helped the incoming on-call consultant to be aware of the patient. In some Trusts and specialties, digital referral systems are used to ensure specific actions in the patient pathway are completed.

Failure to review investigation

(Case Ref: 261)

A 35-year old man, with a previous subclavian vein thrombosis, underwent transaxillary first rib resection for venous Thoracic Outlet Syndrome (VTOS). Dissection was difficult, but eventually the portion of the first rib underlying the axillary/subclavian vein was resected, freeing up the vein and removing the element of extrinsic compression at the costoclavicular junction. On completion, the operating surgeon, noting the proximity of the resected first rib to the apex of the parietal pleura surrounding the lung, remarked to the anaesthetist that he didn't think the pleura had been breached, but that they should exclude a pneumothorax on completion of surgery. At the end of the operation, the anaesthetist confirmed air entry throughout the lung fields, but ordered a chest x-ray to be undertaken in recovery. At midnight the same evening, the on-call surgical registrar was called to review the patient who was breathless. Review of the chest x-ray confirmed a 20% pneumothorax, which, after telephone consultation with the surgeon, was managed conservatively. The next morning the patient felt better and repeat chest X-ray confirmed that the pneumothorax had almost completely resolved. The patient was discharged the same day.

Reporter's Comments:

Having ordered an investigation. A clinician is under obligation to review the results of that investigation particularly when the results may dictate an urgent clinical response. There was a failure of communication in this case with respect to who had responsibility for following up the patient's outcome. Ultimately, responsibility for the patient lies with the surgeon who should have checked up on the x-ray results.

CORESS Comments:

Failure to follow up critical investigations is a common theme in CORESS reports. Formal hand-over from theatre to the recovery team, and subsequently to the ward staff, should have documented the outstanding investigation, and resulted in review. In the case of severe respiratory compromise, a chest drain may have been indicated in this case. IT systems which flag up an investigation or report, on a 'traffic light' system, by text or email to the requesting clinician, may have some value.



Communication problems during EVAR

(Case Ref: 262)

An endovascular infrarenal aortic aneurysm repair (EVAR) was undertaken on a 65-year old man as an emergency procedure for a ruptured aneurysm. At completion of the procedure, angiography was undertaken with a pig-tail catheter to confirm graft position and to exclude endoleaks.

The COOK® measuring pig-tail catheter comes with a single-use peel-away sheath to help the user load the catheter onto the wire. Once the catheter tip has been loaded on the guide wire, user instructions recommend that the peel-away sheath is removed.

In this particular case, in which radiologist and vascular surgeon were working together, one operator retracted the peel-away sheath to the catheter hub (within the native iliac artery) for use throughout the case, but unbeknownst to the other operator. During the case, the peel-away sheath was inadvertently advanced by the other operator, who was unaware of its presence, and became lodged in the iliac limb of the endovascular stent graft.

Following successful completion of surgery, the patient was discharged home after 3 days, but two weeks later, presented with an ischaemic limb due to iliac stent occlusion. CT scan demonstrated the probable cause of the occlusion, a radiolucent structure, the residual peel-away sheath, which had not been removed, within the iliac limb of the EVAR.

Reporter's Comments:

There was suboptimal communication between the operators and team members. Endovascular devices should be used within their indications and according to instructions.

CORESS Comments:

In an emergency situation, as in this case, it often helps to have someone with oversight of the whole case, not necessarily the operating surgeon (or radiologist). This could have been senior scrub staff, empowered to comment on progress and technical aspects of the procedure. However, when a joint procedure is undertaken, and individual operators are carrying out separate actions, as on an aircraft flight deck, communication remains paramount.

A basic principle reducing risk of retained foreign body, is to "count out" all foreign objects during surgery. This is frequently not done with endovascular wires and sheaths, but is highlighted as good and necessary practice in the National Safety Standards for Interventional Procedures.