CORESS Feedback - Cases from the Confidential Reporting System for Surgery
Professor Frank CT Smith, Programme Director on behalf of the CORESS Advisory Board

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Following a series of drug errors described in the last CORESS Feedback, a further case illustrates the frequency with which these potential adverse events occur. Venous thromboembolism affects all areas of surgery and two cases here draw attention to consideration of the diagnosis, and risks for developing VTE. The need to assess placement of central lines is illustrated by 2 further cases, as are risks to the ureter in pelvic surgery.

We are grateful to those who have provided the material for these reports. The online reporting form is on the website (www.coress.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

Missed pulmonary embolism
(Case ref: 272)

A 45-year old lady presented to her GP with a tender swollen calf following her return from a skiing holiday, during which she had had a nasty fall. She had also developed a cough and was referred to the ED department of the local hospital for a chest x-ray.

When she attended hospital, she was sent for an x-ray which demonstrated some shadowing. The attending doctor failed to pick up on the reason the patient had initially attended her GP, her calf injury, but noted a family history of lung carcinoma and arranged an outpatient CT scan which was booked for the next week.

In the interim the patient developed shortness of breath and haemoptysis 2 days after being seen in the ED and reattended, at which time the CT scan was undertaken urgently. This confirmed the presence of a large pulmonary embolus and D-dimers were positive.

The patient underwent thrombolysis and was anticoagulated. The Trust settled out of court for the missed deep vein thrombosis and PE.

CORESS comments:
The main lesson in this case is the need to take a full history. In the presence of a swollen calf and cough, the diagnosis of DVT, possibly in association with a PE, should have been considered. Early lower limb venous duplex and measurement of D-dimers would have been helpful and would probably have directed clinicians to request an urgent CT pulmonary angiogram.
This was the first day on which elective surgery was resumed following the Christmas break. A total gastrectomy was scheduled. The theatre list was prepared and checked on the morning of surgery. The surgeon intended to use a powered stapling device for the anastomosis. This had been a recent change to the surgeon’s practice which was assumed to be common knowledge amongst theatre staff.

The team brief was completed. Equipment was identified but there was no specific mention of using a powered circular stapler rather than a standard stapler. A new member of staff scrubbed for the case and was not able to review the surgeon preference book (which was later retrieved from another theatre). The Surgical Clinical Practitioner confirmed that all stapling devices were available but didn’t specifically mention powered stapling devices. Once the resection was performed, the circular stapler anvil was requested and gun size (25mm) checked with the consultant. Unknowingly, the anvil for the non-powered gun was secured in place with a purse string. No mention was made of the powered stapler, therefore a non-powered version of the staple gun was handed over. When this was given to the surgeon, it was realised that this was in fact the non-powered gun, and the non-powered anvil was now sutured in-situ.

With this deviation from plan, the consultant considered the available options. The only way of switching from non-powered to powered device would have been to remove the already secured anvil of the conventional stapler, replace with the anvil of the powered gun, and re sutures - a process which, in a high-risk case, was not advisable unless absolutely necessary. The clinical practitioner de-scrubbed to locate a powered stapling device and to contact the company representative for the device, for troubleshooting advice (he was non-contactable). The surgeon decided to proceed with the non-powered stapling device. The anastomosis was completed safely without further incident, the staple line checked and confirmed to be intact.

A thorough team debrief was completed which identified that no one person was responsible for the error and that this was caused by communication failures at multiple points during the case.

**CORESS & Reporter’s comments:**

A variety of factors contributed to the operative confusion. This was the first day back at work after a prolonged holiday break for theatre staff, who may not have been fully up to speed with what was required for the case. At the brief, no-one (including the consultant), specified the need for the powered stapler gun. The theatre team were not used to using the powered stapling device as standard practice. Previous cases had been overseen by a company representative who was not present, and who could not be contacted on this occasion.

This was a classic case of the ‘Swiss cheese’ effect resulting in an adverse incident, compounded by poor communication. The consultant should have checked that the theatre team were aware of the required kit and had this available, and he, or she, should have checked this prior to commencing surgery.

Changes subsequently made to reduce the risks of re-occurrence included:

1. Listing the staple device required on the operating list.
2. Placing an information poster in theatre listing stapler preferences for procedures, and by consultant.
3. Establishment of a group email (including theatre, anaesthetic, and surgical teams) to communicate information to all team members concerning operating lists.
4. Ensuring surgical kit needs are clearly communicated at the pre-operative brief.
5. Ensuring that the surgeon checks the requisite kit preoperatively.
6. Appropriate staff training in use of new equipment.

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**Gastrectomy kit miscommunication**

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**Leaking gastrostomy**

(Case Ref: 274)

A 58 year-old female, with a right pyriform fossa squamous cell carcinoma treated with radiotherapy, was listed for a laparoscopic gastrostomy due to weight loss and difficulty in swallowing.

At surgery, 2L of ascitic fluid was drained. A small gastrostomy was created on the anterior gastric wall using a diathermy hook via an incision in the epigastric area. The gastrostomy tube was passed via the abdominal incision through the gastrostomy, into the stomach, having checked balloon function. The tube was assessed to ensure it was in the gastric lumen. The balloon was then inflated using 5 ml sterile water and pulled back gently to the abdominal wall. 20 ml of normal saline was infused through the tube to ensure no leakage. The peritoneal cavity was deflated, and the gastrostomy tube secured to abdominal wall using 2/0 silk. The laparoscopic umbilical defect was closed with Prolene. Because of inexperienced in laparoscopic suturing, the surgeon did not perform a purse string around the gastrostomy incision, or suture the stomach to the abdominal wall.

Feeding was started 48 hours post insertion, and the dietitian recorded: “Feed now running with no problems. Patient feels a little bloated but otherwise comfortable”. She was discharged on the same day with arrangements for home nutrition.

The patient was readmitted after 4 days with generalized abdominal pain, raised CRP and normal WCC. An urgent CT scan recorded “New large gas-air fluid level in the abdomen. Majority of PEG tube located within the subcutaneous tissue, with the tip outside the stomach lumen.” A CTPA showed left-sided pulmonary artery segmental branch acute embolism.

The patient underwent emergency laparotomy at which the findings were of enteral feeding fluid in abdomen. The gastrostomy tube had migrated out of the stomach with the balloon inflated. The abdomen was washed out, a nasogastric tube placed in-situ and the gastrostomy revised, this time with a purse string suture. The stomach was secured to the abdominal wall with 4 x 2/0 PDS sutures. The patient was admitted to the ITU but developed multigland failure and succumbed 21 days after the salvage laparotomy.

**CORESS & Reporter’s Comments:**

Since description of the open Stamm gastrostomy, variations of the procedure using a balloon catheter, involve securing the catheter by purse string suture and/or fixation of the stomach to abdominal wall, to prevent dislodgement of the tube from the stomach.
With abdominal wall distention in the presence of ascites, there may be increased tension on the gastrosomy tube, with higher risk of dislodgement. Laparoscopic surgery involves more than small incisions, and the skills required for delivery of safe surgery include the need for safe laparoscopic suturing skills. In some centres combined laparoscopic and endoscopic teamwork is employed for PEG placement.

Fatal pulmonary embolus after renal cancer surgery (Case Ref: 275)
A 65 year-old female had surgery for a large left renal tumour. The tumour was more advanced than anticipated and intra-operatively the decision was taken to undertake a multi-visceral resection: en-bloc nephrectomy, distal pancreatectomy, splenectomy and left hemicolecotomy (with end colostomy). She recovered well from the surgery and the renal cancer was completely resected. She underwent uneventful elective reversal of colostomy 18 months later and was discharged 7 days postoperatively. Seven days after discharge, she suddenly developed acute breathlessness and circulatory collapse, consistent with pulmonary embolism. Resuscitation and acute thrombolysis were unfortunately unsuccessful.

Reporter’s & CORESS Comments:
For the reversal of colostomy, thromboembolic prophylaxis had been provided as a routine, with calf-compression intra-operatively, VTE stockings and chemoprophylaxis while in-hospital. Extended chemoprophylaxis was not provided. Extended prophylaxis is offered at our institution in line with 2018 NICE guideline for patients undergoing surgery for cancer:

https://www.nice.org.uk/guidance/ng89/chapter/Recommendations

The Guidelines recommend:

• Provide anti-embolism stockings until the person no longer has significantly reduced mobility relative to their normal or anticipated mobility.

• Add pharmacological VTE prophylaxis for a minimum of 7 days for people undergoing abdominal surgery whose risk of VTE outweighs risk of bleeding, taking into account individual patient factors and according to clinical judgement.

• Consider extending pharmacological VTE prophylaxis to 28 days postoperatively for people who have had major surgery in the abdomen.

It may be that extended prophylaxis would have reduced this patient’s likelihood of experiencing a fatal PE. We wish to flag this to the profession, so that surgeons undertaking major abdominal-pelvic surgery for “benign” disease or malignancy should consider providing extended chemoprophylaxis.

Formulary changes contributing to near over-dosage (Case Ref: 267)
A neurosurgical patient in her 50s, with a history of Multiple Sclerosis was referred for a trial of intrathecal baclofen therapy. This involves placement of a lumbar spinal Intrathecal catheter and injection of a small test amount of baclofen followed by physiotherapy assessments.

The dosage of baclofen used is usually 50 micrograms, given as an intrathecal bolus. This dosage is dispensed by the pharmacy in a 1 ml ampoule. Units who offer intrathecal baclofen pump placement and maintenance also regularly refill the implanted baclofen pumps of their treated patient cohort. In this case, pharmacies dispense 20ml of baclofen solution at a strength of 500 micrograms per ml, to 3000 microgram concentration, as required by the dosage.

In the case described here, pharmacy dispensed a 10ml vial of Baclofen, at a concentration of 500micrograms/ml, instead of the conventional test dosage of a 1ml solution of 50micrograms used for trial purposes. Over-dosage, and potential baclofen toxicity, was narrowly averted when this dose (10 times the required concentration of baclofen), was identified at the final cross check before the trial injection was administered.

Reporter’s Comments:
The learning point from this near miss is the importance of cross checks. Additionally, pharmacies should warn clinicians of any changes in the dispensing formulary, particularly if these changes relate to long established practice.

CORESS Comments:
CORESS has previously described other medication errors. These can occur in:

• choosing a medicine—irrational, inappropriate, and ineffective prescribing, under-prescribing and over-prescribing;

• writing the prescription—prescription errors, including illegibility;

• manufacturing the formulation to be used—wrong strength, contaminants or adulterants, wrong or misleading packaging;

• dispensing the formulation—wrong drug, wrong formulation, wrong label;

• administering or taking the drug—wrong dose, wrong route, wrong frequency, wrong duration;

• monitoring therapy—failing to alter therapy when required, erroneous alteration.

Aronson1, has classified medication errors according to four broad categories:

• Knowledge-based errors (through lack of knowledge)

• Rule-based errors (using a bad rule or misapplying a good rule)

• Action-based errors (called slips)

• Memory-based errors (called lapses)

This case involved a change in stock formulary and dispensing. It remains the individual clinician’s responsibility to check each drug, ampoule and date, prior to injection.

1. Medication errors: what they are, how they happen, and how to avoid them. J.K. Aronson QJM: An International Journal of Medicine, 2009;102 (8) 513-521,

https://doi.org/10.1093/qjmed/hcp052
Ureteric Injury 1

A 51 year-old female with a long history of complex diverticular disease developed a chronic abscess in the pouch of Douglas. It was decided that a sigmoid colonic resection was the way forward, but that preoperative placement of ureteric stents would help the surgeon identify the ureters.

Surgery was difficult due to very thick fibrotic reaction in the pelvis and a Hartmann’s procedure was performed using a high energy device. The inferior mesenteric pedicle was not mobilised, and dissection took place in a plane close to the colon. A pelvic drain was placed, and the stents remained in situ. Recovery was complicated by an ileus and pelvic collection, noted on a day-7 CT scan.

External drainage of the collection was secure but the sepsis continued for a further two weeks and a further scan showed the size of the collection increasing. Electrolyte analysis of the drain fluid was consistent with urine. A cystogram was performed which demonstrated no bladder abnormality. Review of the radiology was undertaken and on this secondary review it was clear the left ureteric stent had been divided and was the source of the urine leak.

Urgent nephrostomy was undertaken, and the patient was able to go home with a view to re-implanting the ureter at a later date.

Reporter’s Comments:

Stents do not prevent ureteric damage but should allow easier identification of the structures at surgery, and hence preservation. Unfortunately, the damage was not noted intra-operatively, or post-operatively, on two separate scans. Use of the high energy dissection device reduces the tactile feedback associated with traditional dissection.

Retrospectively, hyperchlaemia was present on day 4 and could have alerted the team to a urinary leak at an earlier stage.

CORESS Comments:

Prophylactic ureteric stents potentially reduce rates, and facilitate intraoperative recognition, of iatrogenic ureteric injury (IUI) during colorectal resections. However, there is a lack of consensus concerning risks and benefits of this practice. The most frequent indications for prophylactic stents are diverticular disease, neoplasia and inflammatory bowel disease.

A systematic review has recently concluded that placement of prophylactic ureteric stents has a low complication rate 1. However, there is insufficient evidence to conclude that stents decrease ureteric injury or increase intraoperative detection of inadvertent ureteric injuries (IUI). Apparently higher rates of IUI in stented patients likely reflect use in higher risk resections. The use of lighted ureteric stents may facilitate recognition of the ureter in laparoscopic surgery.


Ureteric Injury 2

A 72 year-old man presented with a pulsatile abdominal swelling. A 6.8cm infrarenal aortoiliac aneurysm, with concomitant left and right iliac aneurysms measuring 5cm and 4.2 cm respectively, was demonstrated on CT angiography.

After anaesthetic assessment and CPET testing, the patient was listed for open aneurysm repair. Fully informed consent was undertaken, at which risk of ureteric injury was discussed and documented. Surgery was complicated by the inflammatory nature of the aneurysm and although the ureters were sought prior to implantation of an aorto-to-bilateral iliac bifurcations bypass, the surgeon documented in the operation note that the left ureter could not be found in the vicinity of inflamed left iliac aneurysm.

Postoperatively the patient made a satisfactory initial recovery with discharge at 5 days. At day 9 postoperatively however, he developed rigors and was readmitted to hospital where a CT scan confirmed a left pyonephrosis, and obstructed left ureter at the pelvic brim, requiring nephrostomy. Attempted stenting of the ureter was unsuccessful, and the urologists eventually undertook a diversion procedure. The patient took 3 months to recover.

Reporter’s Comments:

Medical litigation was instigated but was eventually abandoned on the advice of an expert witness who commented that the patient had received appropriate informed consent, warning of potential consequences of ureteric injury; that the injury was a recognised complication of iliac aneurysm repair; and that the surgeon had demonstrated awareness of the potential for injury, documenting inability to demonstrate the ureter in the operation note. Nonetheless, this was an unpleasant salutary experience for both patient and surgeon.

CORESS Comments:

CORESS is aware of similar cases in which litigation has been successful and that adequate consent was not held to be a mitigating factor. The option of Endovascular Aneurysm Repair (EVAR) would have been considered in many vascular units, in this situation.

Line Problem 1 - PICC Line Misplacement

A 52 year-old man had a Peripherally Inserted Central Catheter (PICC) line inserted via the left cephalic vein for administration of long-term chemotherapy. Ultrasound guidance was used to aid peripheral line insertion, but no central imaging was undertaken.

Some hours after return to the ward, a chest x-ray was undertaken. This showed the tip of the PICC line to be curled up in the right atrium. The patient had not suffered from arrhythmia or other cardiac-related side-effects. The vascular registrar was called, who reviewed the x-ray and gently pulled the line back approximately 4 inches. A subsequent x-ray undertaken 2-3 hours later, confirmed that the tip of line was still located in the heart. By this time another vascular trainee was on duty and attended to pull the line back a further four inches. On this occasion, check X-ray confirmed that the tip of the line was finally located in the superior vena cava.

NICE has issued very specific guidelines on placement of PICC lines. Some commercially available systems use the patient’s cardiac electrical activity to track catheter tip location or employ magnetic navigation with external measurement to determine tip positioning. Otherwise, fluoroscopy or chest X-ray should be undertaken to ensure that the catheter tip lies in the superior vena cava prior to usage. In this case, no immediate imaging was undertaken to confirm correct siting of the catheter tip at initial placement, or during the subsequent two interventions to retrieve the inappropriately sited catheter from the patient’s heart.

Reporter’s & CORESS Comments

NICE guidelines do not state that central imaging must be undertaken, and hence the team may have been following the national guidelines. However, there is no evidence to suggest that a central imaging should not be performed in the event of PICC line migration. In this case, the team did not follow the national guidelines in the case of a central line.
Advisory Board members commented that PICC lines may be variable in length and the length should be determined prior to placement. Imaging is mandatory following placement. Many units have a dedicated PICC line placement team and line placement should follow standardised guidelines within a Unit.

Line problem 2 - CVP line causing haemothorax

A 69-year-old man was extubated in theatre and taken to the ICU at the end of the day, following complicated surgery to remove a large colonic tumour. For rehydration purposes, a 16 G central venous line was placed via an anterior approach to the right internal jugular vein, using a Seldinger technique, under ultrasound control. Free blood was obtained from the catheter on aspiration after placement in the superior vena cava.

Two hours later, the patient developed chest pain with a mild tachycardia, pulse rate of 95bpm and his blood pressure dropped to 105/70 mmHg. A chest X-ray was undertaken in which the tip of the catheter was visualised within the thorax. A small haemothorax was noted.

The patient was resuscitated with fluids, normalising blood pressure and pulse rate and the on-call vascular surgical registrar was called for advice. He suggested that the central venous catheter should be removed gently under aseptic technique. This was done by intensive care staff. Within an hour, the patient’s observations deteriorated again, and a further urgent chest X-ray confirmed a large haemothorax. The cardiac surgical team were called, and the patient was taken to theatre, where median sternotomy was undertaken, the haemothorax drained and a small tear in the superior vena cava oversewn.

The patient subsequently made a satisfactory but protracted recovery from surgery.

CORESS Comments:

After central venous access device (CVAD) insertion, a post-procedure check chest X-ray (CXR) should be reviewed by the individual who performed the procedure. The tip of a CVAD should be verified on chest X-ray prior to use and the exact location of the tip documented in the medical notes, unless a tip location device has been used to verify tip location (when a CXR not required). Once the patient had been diagnosed with a haemothorax, probably due to a misplaced catheter tip, removal should have been approached with caution. Placement of a guidewire, prior to catheter removal might have allowed an endovascular approach to treating the perforated vena cava.

A useful aide-memoire with regard to a misplaced central venous catheter, in the short-term, is: “If in doubt, don’t take it out.”2 Evaluation followed by removal of the catheter under vision after adequate exposure is advocated. This is in contrast with the situation of the misplaced endotracheal tube where the advice is: “if in doubt take it out.”


Journal of the Association of Surgeons of Great Britain & Ireland

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Please complete the survey (link below) to tell us what you think:

https://www.surveymonkey.co.uk/r/X26JQC7
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(Ass at Summer 2017)

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The Journal of the Association of Surgeons of Great Britain and Ireland (JASGBI) is a regular publication that has evolved from the previously named Newsletter. It aims to publish material of topical or general interest to members of the Association, which will promote and advance the reputation and functions of the Association to a wider professional audience.

JASGBI is not a peer reviewed, academic publication, and is not intended as a vehicle for conventional academic papers. We nevertheless welcome a wide range of subject matter which may include:

- Articles of national and strategic relevance in relation to surgical training, teaching, career development, and issues in national politics, as they bear upon surgical and professional practice.
- Articles of topical debate.
- News from the Regions, and from affiliated Specialty Associations and Societies.
- Articles on international surgical practice, as observed by members of the Association on their travels, attachments and secondments.
- Historical articles of interest and relevance to surgeons.
- Personal experiences, parallel careers, hobbies, activities and achievements which are out of the ordinary, or which would fit our popular ‘Secret Lives’ series.

This list is not exclusive. JASGBI is keen to encourage and help develop standards in professional writing and to act as a vehicle for new and original material.

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