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Next Edition: June 2016

EDITORIAL

In our first issue for 2016, we look at three cases where deaths occurred as a result of complications arising from day procedures. None of the cases were urgent and in two cases the procedures were sought by the patients for cosmetic benefits and perceived lifestyle enhancement.

Although the cases differed in the type of procedure being performed, common to all three was the failure to recognise rare complications. The seriousness of the evolving symptoms and signs were not fully appreciated by the patients or the clinicians until it was too late. Some of this can be attributed to knowledge gaps on the part of the doctors involved. Much of it can be related to inadequate discharge planning and poor post-operative communication.

Pain is a symptom that is often central to a patient's presentation to their treating doctor. Pain can be difficult to describe and even more difficult to interpret. It is generally expected to occur after most surgical procedures and there can be enormous variability in an individual's response to pain. The spectrum of pain that might be anticipated in the post-operative period is wide-ranging and depends on many different patient and procedure variables. None the less, there are three features that reliably indicate that something is clinically wrong: 1) pain that is not adequately controlled by a medication regimen that would be sufficient for the majority of patients who have undergone that particular procedure; 2) pain that is worsening in severity rather than improving over time (even accounting for anaesthetic or long-acting analgesic medications given in the peri-operative period that have since worn off); and 3) pain that is out of proportion to the physical findings. Any of these features of the patient's pain should prompt more questions in the doctor's mind about the possible underlying problems.

The majority of post-operative complications occur in the early post-operative period, at a time when treating doctors are more cognizant of the potential link between a recent procedure and a new symptom. In some situations however, the risk of post-operative complications can endure long after the patient has recovered from a specific procedure. As the second case demonstrates, in certain scenarios, there is a life-long need for the procedure and its latent risks to be understood by patients, and recognised by their general practitioners who will be providing care for them in the long-term.

The expert commentary in this issue has been written by Dr Nick Collins, an experienced consultant cardiologist and proceduralist. He presents an informative and practical summary of the vascular complications after angiography, and reminds us all to have a low threshold for communicating with the proceduralist.

In the upcoming months we hope to embark on an exciting project to improve the look and feel of our communiqué website. If you have any suggestions, or examples, on what you would like to see, or comments on how you would like to use the website, [please email us](mailto:). We are very keen to incorporate fresh approaches and new ideas based on your input and collective experiences.

ACKNOWLEDGEMENTS

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FEEDBACK

The editorial team is keen to receive feedback about this communication especially in relation to changes in clinical practice. Please email your comments, questions and suggestions to: clinical.communique@vifm.org

CASE #1 POST-OPERATIVE PAIN - WHEN TO WORRY

Case Number:
37/2011

Case Précis Author:
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FFCFM (RCPA), FACEM

CLINICAL SUMMARY

Ms LE was a 28 year old female who was generally healthy and lived with her parents. With the intent of having liposuction, she saw a general practitioner (Dr K), who routinely performed cosmetic surgery in a private clinic. During her preliminary consultation with Dr K, Ms LE declined to divulge the details of her usual family doctor, thus preventing any pre-operative discussions between the two doctors or any post-operative correspondence. The liposuction was booked and performed under sedation on a Wednesday morning and she was discharged home immediately afterwards. The plan for routine follow-up was by way of a phone call from the clinic the next day. The procedure had involved five small incisions in the abdominal region and on the front and rear sides of both thighs. She was prescribed paracetamol and dextropropoxyphene hydrochloride (pain medication) and temazepam (sleeping tablets) by Dr K.

The coroner heard that pain out of keeping with a wound is a “red flag” for something going wrong and should warrant a review in person, even if a patient needed to be persuaded.

That night and the following day, Ms LE looked unwell and complained to her parents that she was sore. She remained in bed much of the time and shuffled in pain when she attempted to walk. On the Friday, Ms LE phoned Dr K on two separate occasions. Dr K arranged for a script for panadeine forte to be made available at a local pharmacy which her father then collected for her. Both parents noted that Ms LE was in greater pain than the previous day. Ms LE told them that she had removed her compression garment (usually worn for six weeks) because of a significant amount of pain. She indicated that Dr K had told her to take them off.

The next morning (Saturday), Ms LE's mother found Ms LE in bed looking yellow and groggy.

Her legs were swollen, patchy, and red with oozing blisters. She admitted to her mother that she had taken in excess of the recommended dosage of panadeine forte to try and control the pain. Her parents drove her to hospital where she was admitted with multiorgan failure and subsequently transferred to a tertiary centre for hyperbaric oxygen therapy and intensive care.

The coroner concluded that the clostridium infection was introduced during the procedure itself though the source could not be determined.

Despite all treatment measures, Ms LE died on the Monday, five days after her liposuction procedure.

PATHOLOGY

A post-mortem examination was conducted and death was found to be due to multi-organ failure that was in turn due to Clostridium perfringens myonecrosis involving gas gangrene of the left leg, thigh, pelvis and rectus abdominis muscle following liposuction.

INVESTIGATION

The coroner examined a number of issues at inquest including whether proper and adequate post-operative advice and care had been provided to Ms LE, and whether more timely provision of medical and surgical care may have prevented Ms LE's death. The coroner also looked at Dr K's operating procedures and environment with respect to the clostridium infection.

Dr K's qualifications and experience in performing a liposuction procedure were accepted by the coroner. His method of sterilizing the skin (particularly in the ano-genital region), products used, and suturing practices were explored. A medical specialist from the Department of Health was called as an expert to report the findings of a site investigation of Dr K's clinic. The expert had identified a number of areas of concern – the operating room was small and crowded; the air reticulation system was unsafe; and the sterilisation techniques used by Dr K may have been defective. Random samples of instruments from Dr K's clinic were sent away for testing and the results showed that all of the instruments that should have been sterile were found to be so.

Clostridium perfringens was not identified.

The Department of Health concluded that the sterilisation and infection control procedures in the surgery were appropriate and adequate.

Two questions that were argued extensively at inquest were: whether or not staff contacted Ms LE the day following the procedure; and whether Dr K had known that Ms LE had removed her compression garment as a result of increasing discomfort. Phone records were obtained that showed a call was made from the clinic to Ms LE on the Thursday. Oral evidence was heard from Dr K, staff at his clinic, and staff involved in Ms LE's care at the receiving hospitals. Conflicting accounts were given and counsel could not establish who had spoken to Ms LE, or whether the conversation had addressed her pain and removal of the compression garment. Dr K gave evidence that after the procedure he did not see Ms LE again. He denied speaking to her on Thursday but recalled the telephone conversations on Friday. Again, there was ambiguity surrounding whether they simply discussed the request for a script or Ms LE's increasing pain or removal of the garment. Dr K stated he had offered to see Ms LE but she had declined the offer.

Ms LE was experiencing a level of pain that was not in keeping with the usual post-operative presentation two days after the event.

Independent expert witnesses were also called - an intensivist and a cosmetic surgeon who both gave evidence to the effect that Ms LE's post-operative care was suboptimal. They opined that the request for stronger analgesia and the need to remove the garment should have prompted a heightened level of concern.

The coroner heard that pain out of keeping with a wound is a "red flag" for something going wrong and should warrant a review in person, even if a patient needed to be persuaded. Had Ms LE been seen by Dr K on Friday, it is likely that she would have been hospitalised at that time. As to the issue of survivability, most of the witnesses agreed that her situation may have been equally grim on Friday as on Saturday, but the chance of treatment success would have been greater.

CORONER'S FINDINGS

The coroner concluded that the *Clostridium* infection was introduced during the procedure itself though the source could not be determined. The coroner acknowledged that gas gangrene complicating surgical wounds was a rare occurrence but had been reported as a lethal complication of liposuction.

Ms LE was experiencing a level of pain that was not in keeping with the usual post-operative presentation two days after the event. This should have generated concern in Dr K's mind about her welfare and he should have insisted on examining her. Nevertheless, the coroner could not make a finding that Ms LE would have survived with earlier treatment.

The coroner endorsed the recommendations made in a 2010 report from the Inter-Jurisdictional Cosmetic Surgery Working Group (established by the Australian Health Ministers' Advisory Council). Two further recommendations were added: 1) that the cosmetic surgery industry adopts an acceptable level of care that must include a post-operative review in person within the first 24-48 hours of a liposuction procedure; and 2) that the Health Department formulate and disseminate treatment guidelines for gas gangrene.

RESOURCES

Cosmetic Medical and Surgical Procedures – A National Framework, Final Report. The Inter-Jurisdictional Cosmetic Surgery Working Group, Australian Health Ministers' Conference 2011. Available at: <http://www.coaghealthcouncil.gov.au/Publications/Reports/ArtMID/514/ArticleID/82/Cosmetic-Medical-and-Surgical-Procedures-A-National-Framework>

Nichols R, Florman S. Clinical presentations of soft-tissue infections and surgical site infections. *Clinical Infectious Diseases* 2001; 33: S84-S93. Available at: http://cid.oxfordjournals.org/content/33/Supplement_2/S84.full.pdf+html

KEYWORDS

Liposuction, *Clostridium myonecrosis*, post-operative complication, gas gangrene, pain

CASE #2 BUT THE OPERATION WAS MONTHS AGO!

Case Number:
13/13 WA

Case Précis Author:
Carmel Young RN

CLINICAL SUMMARY

Ms KL was a 55 year old female with a medical history that included obesity, borderline diabetes, and depression arising from her inability to control her weight. She consulted Dr D, a general practitioner (GP), who was not her family GP, but who provided a general health overview for patients trying to lose weight. She was referred to a surgeon specializing in the area of weight management surgery and after a discussion of the pitfalls, benefits and potential outcomes of surgery, Ms KL indicated she was keen to proceed.

Ms KL underwent laparoscopic adjustable gastric band insertion, commonly known as lap banding, in February 2008. The procedure was uncomplicated and the surgeon planned to commence inflation of the band two weeks after her first review. He wrote to Dr D to inform of Ms KL's progress. The surgeon then reviewed her regularly over the next 18 months, last seeing her in August 2009. At that review, she had lost a significant amount of weight and was happy with her progress.

In November 2009, Ms KL's family GP (Dr Y) was asked to review her at her home. Ms KL complained of feeling dizzy and generally unwell and told the GP she had a fever and was vomiting. She was given prochlorperazine, (an antiemetic medication) and was told to take paracetamol as required.

Vomiting is a feature which needs to be monitored as excessive vomiting can cause migration of the stomach through the gastric band aperture.

Dr Y was asked to review Ms KL again the following day. She complained of having an ear ache and persistent vomiting. Dr Y could not find a source for her infection as her ear drums appeared normal so he advised her to go to the hospital. She declined this and asked for antibiotics for a possible ear infection.

These were prescribed on the understanding that she would go to hospital if she did not improve. The next day she was found unresponsive in her bed and could not be resuscitated by paramedics.

PATHOLOGY

A forensic pathologist conducted a post mortem examination and found that approximately two thirds of Ms KL's stomach had herniated through the gastric band device, causing an obstruction at the band, and extensive necrosis. The cause of death was listed as aspiration of gastric contents in association with gastric necrosis, in a lady with a gastric band device.

INVESTIGATION

The case was reported to the coroner as it was an unexpected death. After collecting statements and the autopsy report, the coroner decided to proceed with an inquest.

All the doctors involved agreed that the extent of necrosis seen at autopsy would have caused considerable pain.

The coroner heard that the specific surgery preferred at that time was laparoscopic adjustable gastric band insertion. Though less intrusive than other forms of weight reduction surgery, the device requires lifelong attention. Vomiting is a feature which needs to be monitored as excessive vomiting can cause migration of the stomach through the gastric band aperture. Once that occurs, vomiting can also become an outcome of the complication because of obstruction of the lumen through the band aperture. The surgeon stated at inquest that Ms KL understood the potential problems with her band, and had been compliant with all the management strategies.

Dr Y gave evidence that he was completely uninvolved in Ms KL's pre- or post-operative care. He only discovered Ms KL had undergone laparoscopic gastric banding as a result of his commenting upon her significant weight loss. She did not provide him with any of the information she had on lap banding, nor the details of her surgeon.

An experienced general surgeon with a speciality in gastrointestinal surgery was consulted as an expert witness to review the case.

He agreed the decision to perform the lap banding was appropriate. He was not critical of the care given but suggested that GPs needed education about aftercare for patients following lap banding. He pointed out that Dr Y was also not aware of a possible link between stomach and referred ear pain due to the position of the vagus nerve in some patients.

All the doctors involved agreed that the extent of necrosis seen at autopsy would have caused considerable pain. Ms KL did not complain of abdominal pain, only of severe ear pain, in the days prior to her death.

CORONER'S FINDINGS

The coroner found that Ms KL's death was preventable. Had she advised her surgeon of her excessive vomiting, or had Dr Y understood the significance of the vomiting, there may have been an opportunity to loosen or remove the device. The coroner stated that – *"The case highlights difficulties GPs face when patients attend more than one GP and there is a lack of communication between the various medical practitioners and the patient. It also highlights the importance of GPs receiving education in the identification and management of complications arising out of gastric band placement"*.

KEYWORDS

Gastric band, obesity, post-operative complication, vomiting, general practitioner

CASE #3 DON'T DISMISS THE ENLARGING BRUISE

Case Number:
31/2012 WA

Case Précis Author:
Dr Ian Summers
MBBS(Hons), DRANCOG,
GCHPE, FACEM

CLINICAL SUMMARY

Ms WA was a 60 year old female with ischaemic heart disease who described symptoms consistent with unstable angina to her GP, Dr L, who referred her to a private hospital. Ms WA's usual cardiologist was unavailable, so Dr P took over her care. The next day a coronary angiogram was performed by Dr P that required a puncture by needle of her left femoral artery, the insertion of a catheter tube, and the administration of contrast material able to be visualised on x-ray during the procedure. The coronary arteries were not blocked, and there was no need to continue with the procedure. The artery puncture was closed using an "Angio-Seal" device that forms a mechanical and collagen chemical plug at the site of arterial puncture.

Prior to the procedure Ms WA had been on clopidogrel. She was also on another anti-platelet agent, aspirin. After the procedure, clopidogrel was swapped to prasugrel, a more powerful anti-platelet agent, and subcutaneous Clexane (enoxaparin) for 10 days. Her aspirin was continued. She therefore had two different anti-platelet agents and a clotting factor inhibitor.

Ms WA stayed overnight in the hospital and was discharged by a cardiologist and a resident the next day. Her discharge records described left groin bruising and a "small haematoma 2cm x 1cm" with "slight tenderness." She was able to walk. Standard post-procedure instructions were given advising that should her haematoma worsen, she should contact her cardiologist. No discharge notes were provided to her or sent to her GP.

On Saturday (day 2 post procedure) the area of bruising was estimated by relatives to be 10cm x 2cm and Ms WA was taking paracetamol and codeine painkillers prescribed by the hospital staff in case of pain. On Monday, (day 4), Ms WA went to see Dr L.

The bruising by now extended across the abdomen and down the leg as a "black band" and she complained of severe pain. She was given Oxycontin and Oxynorm (oral morphine preparations) and commenced on antibiotics. It was recorded that the bruising was the result of an "infected haematoma (from) angiogram." The cardiologist and hospital staff were not contacted.

The next day (day 5), Ms WA was vomiting, and after a phone consultation with another GP at the same practice, a script for an anti-nausea medication (metoclopramide) was written and picked up by her daughter. Ms WA did not attend the GP practice and was therefore not examined.

It was felt that Ms WA did not appreciate the severity of her bruising and deterioration, nor did her GP. It was also felt that the provision of a discharge summary to the GP may have changed the outcome.

On day 6 Dr L was phoned as she felt "cold and clammy." An ambulance was arranged, and she was taken to a regional hospital emergency department. She arrived in full cardiac arrest, regaining a pulse after adrenaline drug administration and defibrillation. She was transferred to a tertiary hospital emergency department and operating theatre where her left groin was explored at the bleeding site and the bleeding site repaired.

Ms WA went to the intensive care unit post-operatively and required laparotomies for ischaemic bowel, complicated by progressive failure of multiple organs. She died 10 days after the initial angiogram.

PATHOLOGY

After post mortem examination the pathologist concluded that the cause of death was multiple organ failure following haemorrhage from penetration of the external iliac artery in association with coronary arteriosclerosis.

INVESTIGATION

Issues that were explored at inquest included: the use of blood-thinning medications, Dr L's response to Ms WA's presentation on day 4, and the location of the arterial puncture. The court heard that Ms WA had

previously undergone coronary stenting that had been complicated by a clot despite the use of aspirin and clopidogrel. She had tolerated enoxaparin in the past. There was somewhat contradictory expert opinion heard about the relative merits of the anticoagulation and anti-platelet agents used, with the amounts used increasing the likelihood of bleeding, but decreasing the chances of coronary artery thrombosis.

Ms WA's family disputed a claim made by Dr L at inquest that Ms WA had denied any increase in the size of the bruise. Dr L also gave evidence that though she did not know the size of the bruising at the time of discharge, Ms WA had told her the cardiologist was already aware that she had a significantly painful haematoma. The coroner did not accept either claim by Dr L.

The failure of the Angio-Seal device to achieve vascular closure was examined. After reviewing the cardiologist's testimony and the angiography images, the coroner accepted that the device had been located in the femoral artery.

CORONER'S FINDINGS

The coroner concluded that the death could have been avoided had Ms WA contacted her treating cardiologists or had she returned to hospital. It was felt that Ms WA did not appreciate the severity of her bruising and deterioration, nor did her GP. It was also felt that the provision of a discharge summary to the GP may have changed the outcome. The coroner recommended that:

1. All hospitals that perform angiograms should provide a discharge summary on which the extent of haematoma, bleeding, pain levels and medications on discharge should be marked.
2. Patients should be encouraged to keep such information and take it to any doctor in the event of complications.
3. Discharge summaries should be provided to GPs electronically or as quickly as practicable.

KEYWORDS

Coronary angiogram, haemorrhage, post-operative complication, general practitioner, anti-platelet agents

EXPERT COMMENTARY RECOGNISING VASCULAR COMPLICATIONS AFTER ANGIOGRAPHY - A WORK IN PROGRESS

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While the safety of invasive cardiac procedures, for both diagnostic and therapeutic purposes continues to improve, the potential for early and late complications remains. The use of radial artery access, compared to use of the femoral artery, has significantly reduced the risk of major vascular complications, while decreasing time to patient ambulation, improving patient satisfaction and facilitating early discharge. Additional refinements have included the use of vascular ultrasound to optimize arterial access, the miniaturisation of equipment, further reducing the likelihood of vascular injury, and the use of vascular closure devices, designed to prevent bleeding in the peri-procedural period while reducing the need for prolonged immobilisation after angiography.

In terms of femoral vascular complications, as reflected in the accompanying case, early recognition and treatment may prevent significant morbidity and mortality.

The use of the femoral artery for vascular access remains the preferred route for angiography for many operators, notwithstanding increasing enthusiasm for the radial artery approach. The critical limitation of procedures performed from the femoral approach remains the risk of vascular complications, which may vary in severity from a small area of cutaneous bruising to life-threatening retroperitoneal haemorrhage. The timing of presentation of these complications also varies and may occur during or immediately after the procedure to days or even months afterward.

Retroperitoneal haemorrhage represents the most feared complication of femoral artery access. Clinical risk factors for the development of retroperitoneal haemorrhage include female gender, small body mass index and use of potent antiplatelet therapies.

From a procedural perspective, an arterial puncture superior to the inguinal ligament predisposes to post procedural haemorrhage. Retroperitoneal haemorrhage typically presents abruptly with features of hypovolaemic shock and requires prompt fluid resuscitation, reversal of systemic anticoagulation and early vascular surgery review.

Ultrasonography is sufficient to document the presence of haematoma, pseudoaneurysm, vessel occlusion and arteriovenous fistulae, and can be used as a baseline for serial assessment.

Fortunately, retroperitoneal haemorrhage is an uncommon complication, occurring in less than 0.5% of cases. More common complications include the development of a haematoma or pseudoaneurysm; the key difference between these entities is the presence of a persisting communication between the femoral artery and the area of haemorrhage in pseudoaneurysm. Both these complications produce localized pain and extensive bruising which may manifest several days after the procedure. Occasionally, inappropriately early ambulation and straining manoeuvres may precipitate the development of symptoms. Pseudoaneurysm may complicate puncture of the superficial, rather than common, femoral artery, as well as anticoagulation and inadequate compression following arterial access. Clinically, the presence of a pulsatile mass and bruit suggest a pseudoaneurysm.

Additional, less common, complications include the development of arteriovenous fistulae, vascular occlusion, dissection and puncture site infection.

Radial artery access, while avoiding the severe complication of retroperitoneal haemorrhage, may result in radial artery occlusion which is typically asymptomatic but may be associated with forearm discomfort. This is important to distinguish from the development of compartment syndrome in patients with discomfort following haematoma due to radial artery access. The presence of painful, pale, cool periphery should alert the treating physician to this possibility and prompt specialist review.

Mortality after diagnostic cardiac catheterisation is rare. In terms of femoral vascular complications, as reflected in the accompanying case, early recognition and treatment may prevent significant morbidity and mortality. While a degree of discomfort is to be anticipated, the need for potent analgesia is uncommon after an uncomplicated procedure and should prompt further imaging. Ultrasonography is sufficient to document the presence of haematoma, pseudoaneurysm, vessel occlusion and arteriovenous fistulae, and can be used as a baseline for serial assessment. CT imaging may offer further insights, particularly if retroperitoneal haemorrhage is suspected. Finally, several of the mentioned complications are rarely seen, with recognition remaining in the realm of the operator; as such, when encountered, a low threshold to contact the proceduralist is essential.

RESOURCES

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