EMERGENCY CASEBOOK

Case of the month: Dissection of the carotid artery as a cause of fatal airway obstruction

L Lacey, N Dabbas, R Saker, C Blakeley

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Carotid artery dissection is a rare entity, and most cases are attributable to causative factors, which include trauma and local malignancy. The vast majority of dissections present with cerebral infarct; those few that present with local mass effect and respiratory compromise may deteriorate rapidly, requiring urgent resuscitation and consideration of endotracheal intubation, which is often dangerous and/or impossible. The case of a spontaneous internal carotid artery dissection in an otherwise healthy young man, leading to gross mass effect and eventual fatal airway obstruction, is presented here. The need for a high index of suspicion for cervical vascular injury in cases of neck injury (even trivial), known head and neck malignancy/irradiation, or coagulopathy is highlighted. Patients presenting with unilateral neck swelling and symptoms related to mass effect must be assumed to have progressive airway obstruction, and difficult intubation should be anticipated.

Carotid artery dissection is a rare entity, and most cases are attributable to a causative factor. We present the case of a spontaneous internal carotid artery dissection in an otherwise healthy young man, leading to gross mass effect and eventual fatal airway obstruction.

CASE REPORT

A 41-year-old, previously healthy Afro-Caribbean man presented to the emergency department with a 4 h history of mild neck discomfort associated with swelling in the left side of the neck. There was no history of trauma, foreign body ingestion, tuberculosis or anticoagulation. At 30 min before arrival he had begun to experience some difficulty swallowing, with no change in voice quality, and shortly after arrival complained of difficulty breathing and experienced haemoptysis of approximately 50 ml fresh blood.

Palpation of the neck showed grossly abnormal anatomy: marked shift of the trachea, cricoid and thyroid cartilages towards the right, and a large, ill-defined, soft, non-pulsatile mass in the left side of the neck. Percussion and auscultation of the chest were found to be normal. A plain radiograph of the chest (fig 1) showed significant shift of midline neck structures to the right, an irregular and compressed trachea, and considerable soft-tissue swelling in the neck bilaterally. Objective measurements indicated good arterial oxygenation and haemodynamic stability. Bedside ultrasonography was inconclusive.

Shortly thereafter, the patient experienced massive haemoptysis, with progressive haemodynamic instability. Despite initial needle cricothyroidotomy and difficult subsequent endotracheal intubation, along with aggressive volume replacement with crystalloids and blood, he developed respiratory trouble and subsequently cardiac arrest. Prolonged attempts to resuscitate were unsuccessful.

Primary autopsy showed intact vasculature in the neck and upper mediastinum, and failed to illustrate a cause for the patient's death. There was extensive haemorrhage into the tissue at the left side of the neck; the bronchi and lungs contained blood; and a large amount of fresh blood was present in the stomach. After fixation, sectioning showed dissection at the origin of the internal carotid artery, immediately beyond its bifurcation. The cause of death was deemed to be pharyngeal haemorrhage secondary to dissection of the bifurcation of the internal carotid artery.

DISCUSSION

Carotid artery dissections (and pseudoaneurysms) are rare entities. Fifty-eight per cent of extracranial dissections are carotid in origin and 88% present with infarct.^{1,2} Other presentations include cervical pain and/or headache, and incomplete Horner's syndrome.¹ Rarely, dissection can cause severe dysphagia, neck swelling, dysphonia, and extremely rarely, rapidly life-threatening airway obstruction.^{3,4} This is due to the symptomatic mass effect from retropharyngeal haematoma. Causes include penetrating or blunt carotid trauma, head and neck malignancy/irradiation, tonsillectomy or peritonsillar abscess, or cervical spine injury/manipulation, the others being attributed to spontaneous dissection.

Spontaneous dissections of the extracranial carotid artery occur most frequently in the internal carotid artery,¹ and can present as respiratory distress due to great vessel compromise and upper airway obstruction. Several authors have described cases of presumed spontaneous carotid artery dissection; however, all of these eventually identified causative factors including aspirin ingestion, schistosomiasis, blood dyscrasias and trivial trauma. Only one case describes spontaneous cervical haematoma after straining, with parapharyngeal and retropharyngeal involvement, which caused near-complete obstruction in an otherwise healthy young man.⁴

Diagnostic imaging can be used to confirm carotid artery dissection in the subacute patient. This can include the use of CT scan or MRI angiography (which has progressively replaced conventional angiography), MRI of the neck, digital subtraction angiography and serial Doppler ultrasonography. Doppler ultrasound remains the mainstay of imaging; however, one of every eight patients with proven carotid artery dissection will have negative initial ultrasound findings,² necessitating serial ultrasound and further imaging, especially MRI.

Endovascular approaches for the repair of carotid artery pseudoaneurysms and dissections (including endoluminal stents and coil embolisation) are useful alternatives to standard surgical repair, and are rapidly gaining popularity. However, in the emergency setting, with a haemodynamically compromised patient, primary resuscitation and stabilisation is paramount. Local mass effect with or without massive haemorrhage precludes easy endotracheal intubation, with disastrous consequences for the patient by way of impending airway obstruction. Airway alternatives include fiberoptic nasotracheal

Figure 1 Radiograph of the chest.

intubation⁴ or immediate surgical airway pending definitive airway.

The present case illustrates that emergency care providers need to maintain a high index of suspicion for cervical vascular injury in cases of neck injury (even trivial), known head and neck malignancy/irradiation or coagulopathy. Importantly, the diagnosis must also be considered in patients who present with unilateral neck swelling and symptoms related to mass effect.

In those patients, difficult intubation should be anticipated, and greater consideration given to its method and timing.

Authors' affiliations

L Lacey, N Dabbas, R Saker, C Blakeley, Emergency Department, Mayday University Hospital, Croydon, London, UK

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Correspondence to: Dr C Blakeley, Emergency Department, Mayday University Hospital, London Road, Croydon, London CR7 7YE, UK; christopher.blakeley@mayday.nhs.uk

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IMAGES IN EMERGENCY MEDICINE

Small bowel obstruction

Small bowel obstruction in children is uncommon; however, if improperly managed, it can lead to bowel ischaemia, necrosis, perforation and death. A 4-year-old boy presented with 4 days of vomiting, absolute constipation and diffuse abdominal pain. His abdomen was grossly distended, with subdued bowel sounds. An abdominal x ray showed several distended small bowel loops (fig 1). Laparotomy showed an internal hernia caused by a mesodiverticular band that created a snare-like opening through which a loop of bowel had herniated and become obstructed. Fortunately, the bowel was still viable, so the Meckel's diverticulum and the mesodiverticular band were resected and the hernia was reduced. Mortality for small bowel obstruction may reach 65% if >75% of the small bowel is necrotic at the time of laparotomy (<http://www.emedicine.com/ped/topic1203.htm>). In our case prompt treatment was given when the bowel was still viable, hence preventing any serious complications.

T Agarwal
M A Butt

Epsom General Hospital, Surrey, UK

Correspondence to: T Agarwal, Epsom General Hospital, Dorking Road, Surrey KT18 7EG, UK; trish_agarwal@yahoo.co.uk

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Figure 1 Abdominal x ray of a 4-year-old boy showing several distended small bowel loops.

Emergency casebook

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Flecainide cardiotoxicity precipitated by electrolyte imbalance. Caution with diuretics

► A man presented with recurrent syncope, weakness and fatigue. His ECG showed marked QRS widening and he had gross hyponatraemia and hypokalaemia. His medications included bendroflumethiazide (long term) and flecainide (started 2 months previously).

This presentation was consistent with flecainide cardiotoxicity exacerbated by electrolyte disturbance. The syncopal episodes probably represented life-threatening arrhythmias. The ECG and symptoms resolved completely once the electrolytes were corrected.

Increased cardiotoxicity with hypokalaemia is documented, but not widely recognised. Hyponatraemia is documented. The clinical effects of flecainide are due to use-dependent block of sodium channels. There are reports that support the use of hypertonic sodium salts to reverse flecainide toxicity via antagonism at the receptor. By this rationale, hyponatraemia would lead to flecainide toxicity. Flecainide has been shown to reduce salt absorption in animal bowel. It is possible that in combination with bendroflumethiazide it acted synergistically to produce profound electrolyte disturbance.

Flecainide cardiotoxicity has a significant mortality and can present non-specifically. Thus, early recognition is essential. This case demonstrates the importance of strict electrolyte control in patients who are on flecainide. We would discourage concomitant use of flecainide and bendroflumethiazide.

▲ Khavandi A, Walker PR. Flecainide cardiotoxicity precipitated by electrolyte imbalance. Caution with diuretics. *Emerg Med J* 2006;24:e26. <http://emjonline.com/cgi/content/full/24/5/e26> doi: 10.1136/emj.2006.044362.

Out-of-hospital use of intubating laryngeal mask airway for difficult intubation cause by cervical dislocation

► The intubating laryngeal mask airway (ILMA) has become a standard tool for difficult airway management in the operating room. Recent reports have outlined interest in its use in the emergency department setting. To date, there are few reports of out-of-hospital ILMA use. We describe an out-of-hospital care of difficult airway, in the context of a major cervical trauma, successfully managed with the ILMA.

▲ Combes X, Jabre P, Ferrand E, et al. Out-of-hospital use of intubating laryngeal mask airway for difficult intubation cause by cervical dislocation. *Emerg Med J* 2006;24:e27. <http://emjonline.com/cgi/content/full/24/5/e27> doi: 10.1136/emj.2006.045112.

An uncommon cause of Epistaxis: Cartoid Cavernous Fistula

► We report on an uncommon cause of epistaxis presenting to the emergency room. Epistaxis is not an uncommon presentation to emergency rooms across the world. The majority are easily controlled and have low mortality. We present a case of a carotidcavernous fistula presenting with massive epistaxis culmination in cardiovascular collapse and death. Awareness of this entity will reduce the frequency of this condition resulting in major morbidity and mortality.

▲ Jiamsripong P, Mookadam M, Mookadam F. An uncommon cause of Epistaxis: Cartoid Cavernous Fistula. *Emerg Med J* 2006;24:e28. <http://emjonline.com/cgi/content/full/24/5/e28> doi: 10.1136/emj.2006.045195.

A cause for concern? Osteopoikilosis found incidentally in the emergency department: a case report

► Osteopoikilosis is a rare, inherited bone disorder, which is usually found incidentally on x ray. It may be mistaken for other, more serious disorders such as bony metastases, causing undue distress to the doctor and patient.

▲ Bull M, Calderbank P, Ramachandran N. A cause for concern? Osteopoikilosis found incidentally in the emergency department: a case report. *Emerg Med J* 2006;24:e29. <http://emjonline.com/cgi/content/full/24/5/e29> doi: 10.1136/emj.2006.045765.

Acute lyeloid leukaemia presenting as faecal incontinence

► Epidural sacral nerve compression as an initial feature of leukaemia is a rare complication. The findings in a 16-year-old boy who presented to an emergency department with symptoms of faecal incontinence are reports here. Radiological imaging demonstrated soft-tissue masses in the sacral epidural space. The diagnosis of acute myeloid leukaemia was confirmed on bone marrow aspirate. The characteristics and management of extramedullary leukaemia are discussed.

▲ Lim H, Cho YS, Jang PM, et al. Acute lyeloid leukaemia presenting as faecal incontinence. *Emerg Med J* 2006;24:e30. <http://emjonline.com/cgi/content/full/24/5/e30> doi: 10.1136/emj.2006.046086.

Death from paracetamol overdose despite appropriate treatment with N-acetylcysteine

► A case of death from severe paracetamol poisoning which present early and received appropriate treatment according to evidence-based guidelines is presented here. It is very rare for patients to die from paracetamol poisoning when they receive N-acetylcysteine (NAC) within 8 h of ingestion. The patient had a marked lactic acidosis on presentation to hospital. This case demonstrates that a patient can die from paracetamol poisoning despite early and appropriate treatment, and raises the question whether lactic acidosis in a patient following paracetamol overdose should prompt the initiation of NAC treatment while awaiting paracetamol levels.

▲ Bourdeaux C, Bewley J. Death from paracetamol overdose despite appropriate treatment with N-acetylcysteine. *Emerg Med J* 2006;24:e31. <http://emjonline.com/cgi/content/full/24/5/e31> doi: 10.1136/emj.2006.043216.

The use of cardiac output monitor to guide the initial fluid resuscitation in a patient with burns

► A case of initial resuscitation of a patient with severe burns is described. Such patients can have hypotension and reduced organ perfusion for a number of reasons, and can remain in the emergency department for many hours while awaiting transfer to specialist centres. The case provides a comparison between resuscitation using traditional burns formulae and a relatively new and simple-to-use cardiac output monitor—the Vigileo monitor (Edwards Lifesciences, Irvine, California, USA). The case demonstrates that relying on fluid regimes alone can lead to insufficient resuscitation. We suggest that using technologies such as those mentioned in this article, which have the potential to be used in the emergency department, could improve the initial resuscitation of patients with burns.

▲ Reid RD, Jayamaha J. The use of cardiac output monitor to guide the initial fluid resuscitation in a patient with burns. *Emerg Med J* 2006;24:e32. <http://emjonline.com/cgi/content/full/24/5/e32> doi: 10.1136/emj.2006.043349.

IMAGES IN EMERGENCY MEDICINE.....

Trans-oculofacial injury from airgun pellet

An 18-year-old boy was accidentally shot with an airgun by a friend while playing at home. He was seen in the casualty unit at Leeds General Infirmary, Leeds, UK. A penetrating ocular injury, with a traumatic cataract and vitreous haemorrhage, was observed. A complex trans-oculofacial injury was confirmed by a computed tomography scan (fig 1). The risks of infection and lead intoxication were not marked with retained intranasal air pellet, and no further endoscopic exploration was undertaken. A primary ocular surgical repair was performed with a lens aspiration, followed by surgery for retinal detachment. Air weapons are an important cause of serious eye injuries in adolescent boys. A survey by the British Ophthalmic Surveillance Unit raised questions regarding airgun use.¹ The UK Government has changed the legislation recently to deal with increasing public concerns over airgun misuse. Despite new legislation, airgun pellets remain a cause of sight-threatening ocular injury.

S Iqbal

Department of Surgery, Leeds General Infirmary, Leeds, UK

M M K Muqit

B J O Mathews

F Bishop

Department of Ophthalmology, Leeds General Infirmary

Correspondence to: M M K Muqit, Department of Ophthalmology, Leeds General Infirmary, Great George Street, Leeds, LS1 3EX, UK; mmmk3@aol.com

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Figure 1 Computed tomography at initial presentation. Coronal orbital views show haematoma in the right ethmoid sinus and a medial orbital wall fracture. The airgun pellet is embedded in the midline nasal bones, and lies in close proximity to the cribriform plate above (A). Axial computed tomography scan showing orbital emphysema with disruption of the paranasal sinus mucosa, and ethmoid sinus haematoma. There is retro-orbital haemorrhage and the airgun pellet is embedded in the nasal bony architecture (B).

An unusual fracture of the scapular body

Figure 1 X-ray showing an angulated fracture of the body of scapula.

Fractures of the scapula are infrequent; they constitute 3-5% of all shoulder girdle injuries and 1% of all fractures. Fractures of the scapular body/spine make up 50% of scapular fractures.¹ A 36-year-old man fell off a horse and sustained a direct injury to the shoulder. On examination, the patient had a prominence over the inferior angle of the scapula with restricted range of movement of the shoulder, especially protraction and retraction of shoulder. Radiographs revealed an unusual fracture of the body of the scapula with an apex anterior angulation of 40° on the scapular Y view.

Scapulohoracic movement is complex and has six movements: elevation, depression, upward rotation, downward rotation, protraction and retraction and they are an important part of the movements of the shoulder girdle. Although most scapular body fractures are treated conservatively, fracture malunion can have adverse mechanical and functional effects on shoulder movement.¹ Scapular snapping syndrome is one of the problems that could arise from malunion.

Accident and emergency staff need to be aware of these complications and the importance of ordering scapular Y views. These fractures would merit an early orthopaedic referral.

S M Y Ahmed, R Ahmad, S Shobaki

Department of Orthopaedics, Weston General Hospital, Weston-Super-Mare, Somerset, UK

Correspondence to: Mr S M Y Ahmed, Weston General Hospital, 30 Hope Street, West Macclesfield SK10 1BE, UK; shahbazmy@gmail.com

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