

# PostScript

## LETTERS

### Technique for upgauging peripheral venous cannulae in volume resuscitation

Achieving large-bore venous access in a shocked patient is a frequent problem encountered by the emergency department physician. Alternatives<sup>1-3</sup> to standard cannula-over-needle percutaneous cannulation are time/operator dependent, and confer increased potential morbidity. We aimed to prospectively validate the anecdotally described, but largely overlooked, technique of utilising an initial distending volume of saline to facilitate large-bore peripheral venous cannulation.

With regional ethics committee approval and verbal consent, adult ( $\geq 16$  years) patients presenting to our tertiary emergency department with a clinical diagnosis of hypovolaemia (pulse  $\geq 100$  bpm, systolic blood pressure  $\leq 100$  mm Hg, aetiology of presentation consistent with haemorrhage or dehydration) were studied. Patients were excluded if on application of standard tourniquet, a vein of suitable calibre was successfully cannulated.

The study technique involved siting a small-calibre peripheral venous cannula (usual catheter-over-needle technique) distally in the upper limb, with the tourniquet remaining tightened, infusing 30-50 ml 0.9% NaCl to distend the venous compartment distal to the tourniquet. A presenting distended vein was then cannulated with a large-bore catheter, again in a standard way. Achieving a cannula bore of  $\geq 18$  G was the primary outcome measure.

Twenty patients (aged 19-78 years) with hypovolaemia of varying aetiology (7 with trauma, 6 with gastrointestinal tract haemorrhage, 5 with sepsis, 1 with abdominal aortic aneurysm rupture and 1 with fat emboli syndrome) were prospectively enrolled from a convenience sample of 52 presentations meeting the study criteria for hypovolaemia. Mean (SD) pulse rate was 119 (11.9) bpm and mean (SD) blood pressure was 86(10.9) mm Hg. Nineteen (95% CI 85 to 100) patients underwent successful incremental cannulation (median initial and subsequent cannula bore 20 (range 24-20) G and 16 (range 18-14) G, respectively). In six (30%) patients, the initial cannula was sited by a pre-hospital provider. One failure was observed in a 19-year-old patient with trauma treated with multiple prehospital venepuncture attempts (resultant extravasation) in the ipsilateral limb. All attempts were completed in  $< 5$  min.

The described technique for upgauging peripheral venous cannulae is simple, relies on the existing skill set of prehospital and emergency practitioners, and is reliable in achieving large-bore peripheral venous cannulation. Although not universally successful, it should be considered as an adjunct to the emergency physicians' armamentarium of vascular access techniques. Of note, due to saline haemodilution, blood aspirated from the second cannula is unsuitable for laboratory analysis.

### Author contributions

MH was involved in study synthesis, ethical approval, performance of the study technique, data analysis and manuscript generation. VT was involved in the study synthesis, performance of the study technique and manuscript generation. GC was involved in study synthesis and manuscript generation.

**M Harvey, Vijay Thumma**

Emergency Department, Waikato Hospital, Hamilton, New Zealand

**Grant Cave**

Intensive Care Unit, Monash Medical Centre, Melbourne, Victoria, Australia

Correspondence to: Dr M Harvey, Emergency Department, Waikato Hospital, Pembroke Street, Hamilton 2001, New Zealand; harvey@mwaikatodhb.govt.nz

doi: 10.1136/emj.2006.037218

Accepted 19 December 2006

Competing interests: None declared.

### References

- 1 Westfall MD, Price KR, Lambert M, *et al*. Intravenous access in the critically unwell patient: a multicentred, prospective, randomised trial of saphenous cutdown and percutaneous femoral access. *Ann Emerg Med* 1994;23:541-5.
- 2 Halvorsen L, Bay BK, Perron PR, *et al*. Evaluation of an intraosseous infusion device for the resuscitation of hypovolaemic shock. *J Trauma* 1990;30:652-8.
- 3 Keys LE, Frazee BW, Snoey ER, *et al*. Ultrasound-guided brachial and basilic vein cannulation in emergency department patients with difficult intravenous access. *Ann Emerg Med* 1999;34:711-14.

### Pneumothorax due to electrical burn injury

Deep tissue damage almost always accompanies local and regional cutaneous burn injuries, especially in electrical burns. The lungs and the heart can be affected by high-voltage arcs in electrical injuries of the chest wall. A 14-year-old boy was electrocuted by an electrical current of 25 000 V. There were second- and third-degree burns on 35% of the total body surface. There was also a severe burn injury extending into the subgaleal plane at the



Figure 1 Right-sided pneumothorax seen on chest x ray, two days after electrical injury.



Figure 2 Pneumothorax has subsided after intercostal tube drainage.



Figure 3 Ten days after removal of the chest drain; pneumothorax has resolved completely.

frontoparietal scalp. Respiratory distress, tachypnoea, tachycardia and right-sided pleuritic pain ensued on day 2. Physical examination and chest x ray revealed collapse of the lungs and right-sided pneumothorax (fig 1). There were no fractures of the clavicle or the ribs. A closed intercostal tube drainage was applied (fig 2). On the 10th day, the chest x ray showed regression of the pneumothorax, and auscultation revealed equal inflation of the lungs. The drain was then removed (fig 3).

It is widely accepted that electrical current causes tissue damage by producing heat due to local tissue resistance.<sup>1</sup> The main issue in electrical burns of the trunk is injuries to the viscera. Pulmonary damage due to electrical current can cause pneumothorax.<sup>2</sup> Although visceral damage usually appears in late stages, organ perforations can occur due to disruption of visceral walls, immediately or several days after direct contact with high-voltage electrical current. Despite the burn injury affecting the left anterior chest wall, development of pneumothorax in the right lung reflects the potential difference between different parts of the body. The probability of pneumothorax must be considered in high-voltage electrical injuries having ports of entry on the trunk.<sup>3</sup> Hence, it is of vital importance to closely monitor all patients with electrical injuries.

**Mehmet Ceber, Can Ozturk, Semih Baghaki, Can Cinar**

Department of Plastic, Reconstructive and Aesthetic Surgery, Istanbul University Cerrahpasa Medical Faculty, Istanbul, Turkey

Correspondence to: Dr Mehmet Ceber, Barbaros Hayrettin Pasa Mah. Poligon Cad. 1011 Sok. Ceylan Apt. No: 1/8, 34250, Gaziosmanpasa/Istanbul, Turkey; mdceber2@yahoo.com

Correspondence to: Mr I H Mallick, 3 Park Lodge, Pitshanger Lane, Ealing, London W5 1RW, England; docmallick@gmail.com

doi: 10.1136/emj.2006.044735

Accepted 5 December 2006

Competing interests: None declared.

This case report was presented at the 27th National Congress of Turkish Plastic, Reconstructive and Aesthetic Surgery, Konya, Turkey, 14–17 September, 2005.

Accepted 14 November 2006

Competing interests: None declared.

## References

- 1 Rai I, Jesche MG, Barrow RE, et al. Electrical injuries: a 30-year review. *J Trauma* 1999;**46**:933–6.
- 2 Khan AH, Siddiqui RJ. Pneumothorax due to electrical burn. *Indian J Chest Dis Allied Sci* 1998;**40**:291–3.
- 3 Sandhir RK, Tiwari IN, Goel A. Management of electrical injuries of the abdomen. *Burns* 1992;**18**:253–5.

## Liver rupture following delivery: HELLP needed

The incidence of subcapsular liver haematoma formation with subsequent rupture of Glisson's capsule is relatively rare, occurring in 1 in 250 000 deliveries.<sup>1</sup> It usually occurs in pregnancies complicated by eclampsia or by HELLP syndrome.<sup>2</sup> HELLP is an acronym coined by Weinstein in 1982, with the findings of haemolysis (H), elevated liver enzymes (EL) and low platelet count (LP).<sup>3</sup> Rupture of the subcapsular haematoma is one of the life-threatening complications of HELLP syndrome. The presenting features may include right upper quadrant or epigastric pain, shoulder pain, vomiting, or features of shock. Because of the variable presentation combined with low incidence, the diagnosis and management is often delayed.

A 28-year-old woman presented as an emergency, complaining of severe right upper quadrant/right lower chest pain and fainting 12 h after a full term, normal, vaginal delivery of a healthy baby. The pregnancy was uncomplicated, with no history of diabetes, hypertension or eclampsia. Blood pressure was 100/70 mm Hg with heart rate of 120 beats/min. Physical examination revealed decreased air entry in the right lower lung base. Abdominal examination revealed tenderness in the right hypochondrium. Blood counts revealed haemoglobin count of 7.5 g/dl, platelet  $57 \times 10^9/l$ , bilirubin 37  $\mu\text{mol/l}$ , alanine transaminase 685  $\mu\text{l}$ , and alkaline phosphatase 127  $\mu\text{l}$ . The clotting profile was disturbed, with an international normalised ratio of 1.6 and low fibrinogen 1.4 g/l (normal 1.5–4). A CT scan of the chest ruled out the possibility of pulmonary embolism. However, a CT scan of the abdomen demonstrated rupture of the liver and the bleeding was contained within the hepatic capsule. The patient was then transferred to the regional liver unit for further management.

All doctors in the emergency department must be aware of this condition and have a high index of suspicion. Prompt recognition and management will reduce the morbidity and mortality associated with this condition.

Ismail Hameed Mallick, Shuja Ali Syed, Asit Kumar Kar

Department of General Surgery, Scunthorpe General Hospital, Scunthorpe, United Kingdom

## References

- 1 Van Dike RW. The liver in pregnancy. In: Zakim D, Boyer TD, eds. *Hepatology: a textbook of liver disease*. Philadelphia: WB Saunders, 1990.
- 2 Schwartz ML, Lien JM. Spontaneous liver hematoma in pregnancy not clearly associated with preeclampsia: a case presentation and literature review. *Am J Obstet Gynecol* 1997;**176**:1328–33.
- 3 Weinstein L. Syndrome of hemolysis, elevated liver enzymes, and low platelet count: a severe consequence of hypertension in pregnancy. *Am J Obstet Gynecol* 1982;**142**:159–67.

## Need for knowledge of local scanners for patients with morbid obesity

We recently came across a very peculiar situation where we could not perform an urgent MRI scan for a patient owing to weight restrictions on the scanner in our hospital (Weston General Hospital, Uphill, Weston-Super-Mare, UK).

A 44-year-old man weighing 197 kg was admitted to our hospital with features of progressive bilateral loss of vision, followed by flaccid paraparesis and loss of sphincter tone, with urinary and faecal incontinence. The patient required an urgent MRI scan of the brain, spinal cord and orbits, but this was not possible owing to weight restrictions on the scanner (<21 stones). The patient was then sent to another hospital for an MRI scan, but the scanner broke under the patient's weight. Finally, the patient was scanned in a private MRI scanner that could take patients up to 250 kg in weight and was diagnosed as having neuromyelitis optica; this whole process took us 7 days. He was transferred to a tertiary hospital and died a few days later.

We have now obtained information regarding the contact of nearby scanners that can take patients with weights up to 250 kg; this has been included in the hospital protocol book.

Obesity is becoming an increasing problem within the UK.<sup>1</sup> Hospitals can expect more patients with weight in excess of the upper limit for most scanners. Given our experience, we think that hospitals should set up contact with nearby scanners that can scan patients with obesity locally, thereby saving lives and preventing potential medicolegal problems.

S M Y Ahmed, K R Bhamidipati, R Ahmad

Weston General Hospital, Uphill, Weston-Super-Mare, UK

Correspondence to: Mr S M Y Ahmed, 36, Greenhills, Killingworth, Newcastle upon Tyne NE12 5BB, UK; shahbazmy@gmail.com

Accepted 2 February 2007

Competing interests: None declared.

## Reference

- 1 Haslam DW, James WP. Obesity. *Lancet* 2005;**366**:1197–209.

## Reviewing blood test results: a worthwhile chore or a waste of time?

It has previously been the practice of many emergency departments (ED) in the UK to routinely review the blood test results of all discharged patients. This time-consuming job is usually performed by a middle grade doctor to act as a safety net in case significantly abnormal blood tests were not acted upon at the time of presentation. We looked at all the blood test results of discharged patients over an 18-month period in a UK ED to see whether discontinuing this practice could be justified. Of the 940 tests evaluated, 128 (13.6%) were abnormal and of these 9 (0.96%) were deemed significantly abnormal—that is, outside the normal range—with the potential to have a clinical effect, and did not have appropriate action documented in the notes by the ED doctor. These nine results were followed up by means of a telephone conversation with the patient's general practitioner. No harm to any patient was demonstrated as a result of the ED attendance. Three patients required further blood tests, all of which confirmed that the initial abnormal result had normalised without treatment. One patient required an outpatient ultrasound scan that confirmed the ED diagnosis of gall stones. Given our results, we concluded that the manual checking of all abnormal blood test results is not worthwhile and our department has discontinued this practice. It has, instead, been emphasised to all doctors that they must review all results of tests that they have requested in patients who are discharged directly from the ED. The responsibility of this lies entirely with the requesting doctor. The middle grade doctors will be eternally grateful at being able to relinquish the task and will also be more likely to benefit patients by spending their additional time on the shop floor.

Peter N Swallow, Claire Vincent, Karen Edwards

Poole Emergency Department, Poole Hospital, Poole, Dorset, UK

Correspondence to: Dr P N Swallow, 1A Snowdon Road, Westbourne, Bournemouth, Dorset BH4 9HL, UK; peteswallow@hotmail.com

Accepted 3 October 2006

Competing interests: None declared.

## Differences in trauma team activation criteria used by hospitals in the South West Peninsula

Outcome from major trauma is improved by a multidisciplinary trauma team.<sup>1</sup> The Royal College of Surgeons (RCS) has suggested criteria for activation of the trauma team,<sup>2</sup> although the evidence to support these is limited, and anecdote suggests that criteria vary among similar hospitals. We undertook a cross-sectional survey of trauma team activation (TTA) criteria used by the six hospitals within the South West Peninsula designated to receive cases of major trauma.

The results highlight a wide variation in the criteria used. One hospital used a two-tier activation system; the rest had a single set of