Cardiac tamponade—knowing how far to insert the wire

Sir,

It is instructive to read the report by Quinn and colleagues [1]. Many of the clinical features they describe mirror a similar case I previously reported and which they partially referenced [2]. In both cases, cardiac tamponade occurred following the rewiring of a central venous catheter and both the immediate clinical assessment and plain chest radiograph did not allude to the presence of this complication. It is reassuring that in their case, further imaging was performed and undue reliance was not placed on the chest radiograph, one of the key points to my original report. I am also pleased that Quinn and colleagues re-emphasize the fact that guidewires should not be inserted too far. They mention the use of graduated guidewires to reduce this risk, with which I would concur, but add the caveat that the user must still be aware of the distance that a wire can safely be inserted and the variation that occurs in persons of varying size [3].

Conflict of interest statement. None declared.

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doi:10.1093/ndt/gfl611

Advance Access publication 12 December 2006

Treatment of severe theophylline poisoning with the molecular adsorbent recirculating system (MARS)

Sir,

Theophylline poisoning is a potentially life-threatening emergency. Successful treatment has been described with both haemodialysis and charcoal haemoperfusion. However, the efficiency of haemodialysis may be reduced, as theophylline is extensively protein-bound. We report a case of serious theophylline overdose successfully treated with the molecular adsorbent recirculating system (MARS).

A 45-year-old male presented following a deliberate overdose of 9 g of modified release aminophylline. On arrival, the patient was conscious and haemodynamically stable. Initial laboratory tests were within normal limits. Plasma theophylline levels collected at the time of arrival to the emergency department were 370 μmol/l (67 mg/l). Soon after initial assessment, the patient’s BP dropped to 89/50 mmHg. Despite aggressive resuscitation, he remained hypotensive.

Six hours after admission the patient was referred to Nephrology services. In view of the high theophylline levels (which had risen to >100 mg/l) and cardiovascular instability, it was decided to commence the patient on treatment with MARS (Gambro-Hospal, Mirandola, Italy). During MARS treatment theophylline levels decreased rapidly, as shown in Figure 1. In response, the patient’s BP rapidly improved. Following completion of an 8 h MARS treatment plasma theophylline levels remained low, although it was necessary to administer intravenous potassium and magnesium supplements.

Removal of theophylline from the circulation is possible with haemodialysis or charcoal haemoperfusion, because the drug has a small volume of distribution, although 50–60% is protein-bound. As such, haemodialysis is only moderately effective at removing theophylline, clearing approximately 50% of drug delivered to the dialyser [1]. Charcoal haemoperfusion is less widely available, will not correct electrolyte disturbances sometimes seen with theophylline toxicity and is associated with bleeding complications.

The MARS consists of a closed circuit containing an albumin-rich solution which permits diffusion of protein-bound and water-soluble substances from the patient’s circulation. The albumin solution is then regenerated by passing it through a standard dialyser plus ion-exchange and charcoal columns. MARS has been described as a treatment for poisoning with Amanita phalloides, paracetamol and phenytoin, but in all of these cases the poisoning was associated with fulminant hepatic failure [2–4]. Our case report demonstrates that MARS led to a rapid reduction in plasma theophylline levels and therefore was an effective alternative to the standard extracorporeal therapies. We hypothesized that MARS should remove both free and protein-bound theophylline, with the charcoal filter clearing additional drug over that removed by dialysis [5]. Certainly the presence of the charcoal filter was important in drug removal when MARS was employed in a case of phenytoin toxicity [3]. As can be seen from Figure 1, drug levels had fallen significantly by 4 h and it is possible that treatments shorter than 8 h may provide adequate drug removal.