Reliable detection of epidural haematomas

Editor—We thank Dr Meikle and colleagues for their informative article on the detection and management of epidural haematomas and we agree with the suggestion in the allied editorial that the true incidence of haematomas is much higher than one every 2 yr in the UK. At our institution, we have a high rate of elective epidural insertion and in the last 6 months there have been two cases that highlight the difficulties in this area of practice. First, a patient developed an epidural haematoma which remained undetected for more than 24 h, and was tragically associated with a poor neurological outcome. Several months later, we transferred a second patient to a tertiary centre for a diagnostic magnetic resonance imaging (MRI) following 5 h of complete motor block after cessation of the epidural infusion. On arrival at the neurosurgical unit, the motor block was receding; no further investigations were performed and the patient was returned the following day. The two transfers for this patient were within 24 h of an elective laparotomy and were not without considerable risks.

On reflection there are further strategies for improved detection of epidural haematomas in addition to those proposed by the authors. Perhaps most importantly, by avoiding high concentrations of epidural local anaesthetic (LA) solutions for top-ups (>0.15% bupivacaine or equivalent) at any point in the perioperative period, the development of complete motor block can be more reliably interpreted as pathological. In the obstetric population, the concentration of a 20 ml bupivacaine bolus that caused motor block in 50% of patients was 0.326% (95% confidence interval 0.285–0.367). Although the incidence of complete motor block with infusions of only low concentrations of bupivacaine is not clear, it is rare enough that if encountered, it should justifiably trigger a protocol for detection of epidural haematoma.

A further strategy to minimize LA-induced motor block is to use patient-controlled epidural analgesia (PCEA) in appropriate patients who are alert and cooperative. A recent meta-analysis of postoperative analgesia for all surgery compared continuous epidural infusion (CEI), PCEA, and patient-controlled analgesia with i.v. opioids. While CEIs provided marginally better analgesia than PCEA (visual analogue pain scores 2.0 vs 2.3, P<0.001), there was a much higher incidence of motor block (28.3% vs 3.2%, P<0.001).

Finally, it is worth noting that the differential diagnosis of complete motor block with epidural infusions includes inadvertent subarachnoid placement or migration of the catheter. An aspiration test has good positive predictive value in this instance, and may prevent unnecessary MRI scanning.

Although we accept that many anaesthetists will continue to use higher concentrations of LA for epidural top-ups, we feel that the above strategies can minimize premature investigation of abnormal neurology in patients with epidurals and lead to prompt initiation of protocols if complete motor block arises.

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Editor—We thank Drs Toner and Prabhu for their correspondence, and agree that the timely diagnosis of epidural haematomas presents a significant challenge, especially in hospitals without 24 h access to MRI scans. We too agree with the opinion expressed in the editorial that the results of our survey suggest that the incidence of epidural haematoma may be significantly higher than suggested by reported cases. We reported an increase of 40 units in which an epidural haematoma had presented over a 6 yr period. This suggests an incidence of ~7 yr⁻¹, assuming that only one case presented in each unit and ignoring the possibility that further cases had presented in the 32 units that reported cases 6 yr ago. This is almost certainly an under-estimate, as it is likely that some cases have gone unreported.

We also agree that, aside from logistical problems, transferring postoperative patients from hospitals that lack 24 h access to MRI facilities in order to investigate the cause of motor block presents significant risk, and avoiding the need to do so wherever possible constitutes good management. Excluding subarachnoid placement or migration of the epidural catheter and avoiding epidural top-ups with high concentrations of local anaesthetic (LA) may contribute to this. However, defining an appropriate maximum concentration of LA to be used for top-ups presents difficulties, owing to significant inter-individual differences in sensitivity to LAs. The limit of bupivacaine 0.15% proposed by the authors is not supported by the data from the research to which they refer: Lacasse and colleagues used the Bromage four-point scale of motor function, and considered a score of 3 or below to constitute motor block. They reported no cases of motor block with 20 ml bolus doses of bupivacaine 0.25%. The extent to which data from obstetric patients translate to postoperative analgesia is debatable, but there is a case for the use of concentrations up to 0.25% for epidural top-ups. We consider the documentation of the dosage and timing of epidural top-ups as crucial to the avoidance of unnecessary investigation of abnormal motor function,
Inter-hemispheric cerebral oxygen saturation differences during thoracic surgery in lateral head positioning

Editor—Near-infrared spectroscopy provides a non-invasive assessment of regional cerebral saturation. Both left and right hemispheres are equally perfused in normal conditions and no significant differences were observed in cardiac surgery where patients are operated in supine position. Patients undergoing thoracic surgery are operated in the lateral position, and therefore, hemispheres can be categorized into an upper and a lower hemisphere. This study was performed to detect differences in absolute cerebral saturation (SctO2) between the upper and lower hemispheres during thoracic surgery in lateral position.

After approval of the Ethics committee and written consent, 29 consecutive patients undergoing thoracic surgery were included in this prospective observational study. Patients were operated in left or right lateral position according to the side of surgery, with the non-dependent, non-ventilated lung on the upper side.

The FORE-SIGHT® (CASMED, CT, USA) oximeter using two sensors placed on the forehead of the patient recorded bilateral SctO2 every 2 s throughout the surgery. Data points were discarded if one of the signals was not available. No alteration in anaesthesia management was undertaken based on the SctO2 measures. All patients received general anaesthesia with sevoflurane, 100% FiO2 breathing gas, end-tidal volume adjusted to maintain PaETCO2 at 3.3–4.0 kPa, ventilatory frequency at 15 min⁻¹, TEA, perioperative administration of 4–8 ml h⁻¹ of bupivacaine (0.1%) and fentanyl (3 μg ml⁻¹) using a left-sided double-lumen tube.

Data were analysed using SAS Jmp version 7 (SAS Institute, Cary, NC, USA). Data distributions are presented as mean ± SD. The difference between the upper and the lower hemisphere cerebral saturation was tested against zero using the t-test and a signed rank test. The proportion of measurement with the upper hemisphere higher, equal, or lower than the lower hemisphere was analysed vs the