Unusual neurological signs complicating epidural analgesia

Suzanne Crowe

Subdural blockade occurs in 0.82% of epidural catheter attempts (Lubenow et al, 1988). It complicates epidural analgesia, and produces a wide variety of neurological signs. Presentation may include delayed, extensive sensory block, sparing of sacral dermatomes, and varying degrees of motor nerve blockade. The spectrum of clinical signs has been well characterized, and can be explained by the anatomy of the dural and arachnoid spaces.

CASE REPORT

A 27-year-old female, para 1+0, requested epidural analgesia for labour, at 4 cm cervical dilatation. She had had previous successful epidural analgesia for delivery of her first child.

Epidural catheterization was established easily at L3–4 by an experienced anaesthetic registrar. Aspiration of the catheter and spinal test dose of 0.25% plain bupivacaine 3 ml were negative. 0.25% plain bupivacaine 7 ml and fentanyl citrate 200 μg were administered. The onset of analgesia was slow; 40 minutes later, the sensory block was up to T6 on the right, T2 on the left, and 60 minutes after insertion, a Horner's syndrome developed on the left side, coupled with complete sensory block, including the scalp. There was no motor blockade on the left side, and minimal block on the right. The patient could not flex her right hip, but could flex her knee and toes. Blood pressure and heart rate remain unchanged from baseline measurements. Labour progressed rapidly, culminating in the vaginal delivery of a live infant, 150 minutes after epidural catheter insertion. Full neurological recovery was complete 3 hours after the initial analgesic dose was administered. The patient did not complain of a postdural puncture headache.

Dr Suzanne Crowe is Specialist Registrar in Anaesthesia, Department of Anaesthesia and Intensive Care Medicine, St Vincent's University Hospital, Dublin 4

DISCUSSION

The trend in obstetric anaesthesia is towards using smaller concentrations of local anaesthetic. This may make detection of catheter position more difficult, as the analgesia produced may lack the florid clinical signs associated with central blocks sited to provide surgical anaesthesia. Subdural block can be diagnosed clinically; radiological confirmation is usually unnecessary and carries its own risks (Bell and Taylor, 1994). A high level of suspicion should exist for subdural catheter placement in any cases which, despite a negative aspiration test, behave in an unusual fashion.

Classical features of a subdural block are:

- Delayed onset of analgesia, usually greater than 30 minutes
- Extensive sensory block, which may be patchy or unilateral
- Complete or partial sparing of the motor roots
- Minimal haemodynamic effects.

Less common presentations of subdural block include Horner's syndrome and motor conduction block involving the lower extremities, upper extremities, respiratory muscles and cranial nerves, leading to respiratory embarrassment and/or apnoea. Any combination of the above may occur, with occasional marked hypotension (Brindle-Smith et al, 1984).

On this occasion, the features are characteristic of those resulting from subdural catherization. Other diagnostic possibilities include subarachnoid injection, multicompartment block, or delayed penetration of the dura.

Anatomically, the subdural space has greater potential capacity posteriorly and laterally. Local anaesthetic placed subdurally will preferentially pool over the dorsal root ganglion. This explains the phenomenon of sparing of the anterior nerve roots, which transmit the motor and sympathetic fibres. However, there is no anatomical barrier to prevent the block from extending to the preganglionic sympathetic fibres and ventral roots. The extradural space terminates at the foramen magnum, but the potential for cephalad spread of local anaesthetic is greater, as the space has limited capacity and distribution continues into the meninges. Large volumes of local anaesthetic may predispose to the development of extensive sensory block and hypotension.

Although well described in the literature, little is known of the long-term sequelae of subdural catheterization, but a case report suggested that compression of the spinal cord or nerve roots can occur secondary to the catheter (McMenamin et al, 1992). As yet there are no reports of a method of deliberate cannulation. HM

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Anaesthetic and critical care dilemmas are coordinated by **Dr Rob Stephens** and **Dr Mike Grocott**, Research Fellows at the Centre for Anaesthesia, UCL, London

Ideas for future dilemmas can be sent to Dr Stephens robstephens@hotmail.com