

Neurological Complications of Regional Anaesthesia - Early Consultation with the Anaesthetist

In the period since our last triennial report, the Council has received a number of reports of major complications following regional anaesthetic techniques. This problem has been further highlighted in a Review of Victorian Public Hospital Claim Files conducted by Drs McNicol and Weaver for the Victorian Medical Insurance Agency which covers public hospitals and which has been widely disseminated amongst professional colleagues.

Of particular concern are reports of delay in the recognition of and response to the evolving signs of neurological compromise. In particular in the case of neuraxial blockade, an urgent response is required to initiate corrective treatment within the narrow 6-12 hour "window of opportunity" before there is irreversible damage to spinal cord or nerve roots with long term nerve deficit or paraplegia. ^{i, ii, iii, iv}

The inherent urgency of the situation requires a structured approach to containing this risk and **early consultation with the anaesthetist is paramount.**

Major regional techniques including sub arachnoid and epidural anaesthesia have the potential to improve outcome in surgery. However, they are performed with acknowledgement of the inherent risk of rare but devastating neurological complications. ^v

These neurological complications may be grouped into two main categories:

- those occurring at the time of insertion which are under the direct influence of the anaesthetist performing the block and may relate to trauma, inexperience, level of insertion, reaction to the drugs employed or there may be no obvious explanation (training and education are essential in avoiding many of these issues).
- those developing later, usually the result of haematoma, sepsis, or ischaemia. These are more common, more insidious, more likely to result in catastrophic outcomes and are theoretically more preventable. They are usually unrelated to any isolated technical inadequacy but result from problems in the system of post-operative surveillance and response involving a number of health care providers.

It must be noted that diagnosing complications of neurological blockade can be very difficult. The clinical scenario may be confused by coexisting neurological diseases, for example, MS or viral myelitis or non anaesthetic iatrogenic causes such as pressure or direct trauma to nerves, hypotension or surgical positioning, all of which have been reported as a cause of spinal cord damage in the absence of local or regional anaesthesia.

Diagnostic uncertainty is aggravated by the knowledge that one or more of the classic signs of developing spinal abscess or haematoma may be absent in approximately 20% of cases. ^{vi, vii} Staff assessing the patient may also confront the use of a variety of different techniques and drugs by different operators with different desired endpoints. To deal with this, nursing staff monitoring the patient need to understand the predicted course of the block and this must be supported by ongoing, individualised education and clear protocols for observation and management.

Any factors which could increase the risk of bleeding or sepsis require interdisciplinary consultation before any block is undertaken and the need for increased vigilance needs to be communicated to all concerned, for example, fluctuating coagulation states or immunosuppression.

All involved should be sensitive to the common presenting signs and symptoms of neurological compression:

- onset of new severe or persistent back pain
- loss or change of motor function (which may be erroneously attributed to the local anaesthetic)
- major change in sensory level or density. (In cases reviewed by council it was a common observation that the density of the sensory block alters just prior to the motor block.)

- any deterioration in observed parameters from a pre-existing steady state
- most importantly there must be recognition of the need to **communicate urgently with the anaesthetist**, their deputy or an appropriate person in the anaesthetic service.

An anaesthetist performing major regional blockade must ensure that there is a system in place whereby they, or their designated deputy, can be contacted and respond at short notice to such a call.

Finally the institution must have a protocol in place to obtain an urgent MRI or CT myelogram and neurological or neurosurgical referral within hours of a diagnosis being suspected.

The logistics involved in coordinating the peri-operative care of these patients by many and various personnel is difficult, but crucial if neurological disasters are to be avoided.

Absolutely critical, is early notification of the anaesthetist or the anaesthetic service, as they are the most appropriate clinicians to coordinate the assessment, investigation and treatment of the complications of these techniques.

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ⁱ Hulme A, Dott NM. Spinal epidural abscess. *Br Med J* 1954; **1**: 64-68.

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ⁱⁱⁱ Statham P, Gentleman D. Importance of early diagnosis of acute spinal extradural abscess. *J R Soc Med* 1989; **82**: 584-587.

^{iv} Metzger G, Singbartl G. Spinal epidural hematoma following epidural anesthesia versus spontaneous spinal subduralhematoma: two case reports. *Acta Anaesthesiol Scand* 1991; **35**: 105-107.

^v Moiniche S, Dahl JB, Rosenberg J, Kehlet H. Colonic resection with early discharge after combined subarachnoid-epidural analgesia, preoperative glucocorticoids and early postoperative mobilization and feeding in a pulmonary high-risk patient. *Reg Anesth* 1994; **19**: 352-256.

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^{vii} Vandermeulen EP, Van Aken H, Vermeylen J. Anticoagulants and spinal-epidural anesthesia. *Anesth Analg* 1994; **79**: 1165-1177.