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Spinal anaesthesia for caesarean section in a patient with undifferentiated intracranial lesion: importance of risk stratification in optimised management

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Introduction

Patients with recently diagnosed and undifferentiated intracranial pathology present challenges to anaesthetists in the obstetric setting. The Monro-Kellie doctrine dictates that since the cranial vault is non-compliant and filled with brain tissue, blood and CSF; an increase in volume of any one of these constituents must be met with a reduction in volume of another to avoid a rise in intra-cranial pressure (ICP).

Displacement of CSF from the cranial to spinal compartment is an important compensatory response to raised ICP. When CSF flow between the cranial and spinal compartments is obstructed, a pressure differential is created following dural puncture with a spinal needle. In the absence of compensatory CSF movement there is a risk of brain tissue herniation through the foramen magnum to equalise the pressure differential. Although rare, this is the most feared of dural puncture complications.

In the context of a District General Hospital, in which such cases are managed infrequently, a simple method of risk stratification is essential for good decision making. Here we present a case of a pregnant woman with intracranial lesion found on MRI following the onset of headache who required expedited caesarean section (CS) to allow for further contrast imaging.

Case Report

Twenty eight year-old normally fit and well primigravida attended her General Practitioner at 35 weeks with a 6 day history of right-sided headache radiating to the neck associated with paraesthesia in the right hand.

MRI revealed a well-defined 10x9mm lesion associated with oedema at the craniovertebral junction. After neurosurgical MDT it was decided to expedite delivery by scheduled CS to allow for contrast MRI to identify the lesion. Patient presented for caesarean section at 38 weeks. She was alert and orientated with neurological examination and clinical history eliciting no signs of raised intracranial pressure. Bloods were unremarkable and drug history included PRN co-codamol for headache. There were no new neurological symptoms, with initial symptoms now intermittent and reduced in severity. After review of radiology and thorough patient counselling, successful delivery by CS was undertaken with spinal anaesthesia.

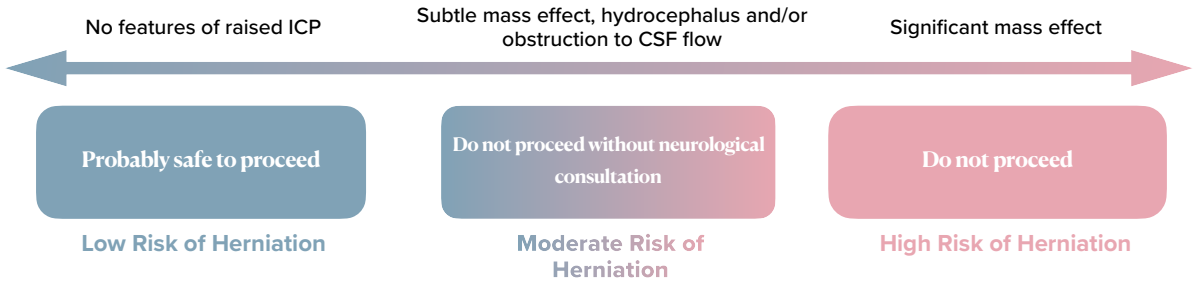


Figure 1. Simple risk stratification of patients with neurological symptoms of SOL based on recent radiological imaging. As adapted from Leffert et al. [2].

Discussion

Spinal anaesthesia is the preferred method for CS, with an acceptable spectrum of risk and numerous benefits when compared to general anaesthesia. In patients with symptomatic intracranial lesions the decision requires further consideration. Breaching the dura with a spinal needle may precipitate cerebral tissue herniation in the presence of raised intracranial pressure. General anaesthesia avoids this but carries with it well described attendant risks in addition to the potential for acute rise in ICP or haemorrhage if the pressor response is not adequately controlled. Literature review reveals numerous reports of patients with intracranial lesions safely receiving spinal anaesthesia [1]. However misperception of risk in the face of persisting neurological symptoms might deny some patients the opportunity of this optimum method of delivery. This is particularly relevant outside of tertiary centres where similar cases are managed more frequently. Awareness of simple-objective risk stratification is key in the presence of neurological symptoms.The excellent review by Leffert et al. describes identification of radiological signs of mass effect, hydrocephalus with or without CSF obstruction and raised intracranial pressure on recent imaging [2] (Figure 2). Here the patient was identified as low risk of herniation from dural puncture despite persisting neurological symptoms.

References

1. P Bhakta et al. (2015). Anaesthetic management of a pregnant patient with cerebral angioma scheduled for caesarean section. Acta Anaesthesiologica Taiwanica; 53(4): 148-49.
2. L Leffert & L Schwamm (2013). Neuraxial anaesthesia in parturients with intracranial pathology. Anaesthesiology; 119: 703-18.