Self-assessment corner

Visual problems following dural puncture

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A 32-year-old woman underwent urgent caesarean section for foetal distress. Inadvertent dural puncture with a 16-gauge Tuohy needle occurred during the anaesthetic but otherwise the operation proceeded uneventfully.

Postoperatively, the patient complained of a classical post-dural puncture headache with occipito-frontal pain that was worse on sitting upright and relieved by lying down. Blood patching with 20 ml autologous blood initially relieved the headache but it recurred in a milder form two days later. The patient complained of double vision on day 10 post-op and on examination a latent squint was noted. The headache resolved by the following day but on day 18 post-op the diplopia was much worse and the findings shown in the figures were easily demonstrated. The patient did not have any history of neurological problems prior to admission. Residual diplopia was present after one year and surgical correction was undertaken.

Figure 1 Patient looking to the right

Figure 2 Patient looking to the left

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Accepted 28 May 1997

Questions

- 1 What is the diagnosis?
- 2 What is the aetiology and differential diagnosis?
- 3 What investigations should be considered?
- 4 What is the management?

Answers

QUESTION 1

This patient has a left abducens nerve palsy with inability to abduct the left eye.

QUESTION 2

The aetiology is thought to be traction on the abducens nerve due to intracranial hypotension which arises secondary to persisting leakage of cerebrospinal fluid (CSF) through the dural puncture.¹ The reduced CSF pressure causes the brain to sag on its attachments, including cranial nerves and bridging veins, creating excessive stretching of these structures. The abducens nerve is most commonly affected by traction injury because of its long intracranial course. Torsion of the nerve can occur as it arches over the apex of the petrous temporal bone.

Palsies of every cranial nerve except I, IX and X have been described as complications of lumbar puncture.² Excluding headache, visual disturbance is the commonest neurological symptom to follow dural puncture³ with abducens nerve palsy having an incidence of between 1:5000 to 1:8000 lumbar punctures.⁴ The delay of a few days before onset of diplopia is not uncommon.⁴⁻⁶ The differential diagnosis is extensive⁶ and examples are listed in the box.

QUESTION 3

Direct imaging of the abducens nerve along its whole course is difficult. Magnetic resonance imaging (MRI) has advantage over computed tomography by potentially demonstrating inflammatory as well as structural lesions. MR angiography is sensitive in detecting intracranial vascular anomalies without performing invasive intra-arterial angiography, and MR venography was useful in this case to exclude post-partum cerebral venous sinus thrombosis.

1 Fernandez E. Headaches associated with low spinal fluid pressure. *Headache* 1990;30:122-8.

2 Atkinson RS, Rushman GB, Davies NJD, eds. *Lee's synopsis of anaesthesia*, 11th edn. Oxford: Butterworth Heinemann, 1993; pp 691-745.

3 Vandam LD, Dripps RD. Long-term follow-up of patients who received 10,098 anesthetics. *JAMA* 1956;161:586-91.

4 Heyman HJ, Salem MR, Klimov I. Persistent sixth cranial nerve paresis following blood patch for postdural puncture headache. *Anesth Analg* 1982;61:948-9.

Differential diagnosis of abducens nerve palsy

Localised brain stem lesions

- demyelination

Intrinsic diseases of the nerve, neuromuscular junction and muscle

- ischaemia secondary to diabetes mellitus or vasculitis
- myaesthesia gravis
- ocular myopathy

Extrinsic pressure or traction on the nerve

- berry aneurysm
- raised intracranial pressure from tumour, haemorrhage or trauma
- reduced intracranial pressure following dural puncture

QUESTION 4

Subsequent management is conservative if no causative factor requiring treatment is present. The spontaneous recovery rate for unilateral isolated abducens nerve palsy is quoted as 78.4% with no further improvements occurring after one year.⁷ Surgical correction of the squint may be appropriate to improve binocular vision and also for cosmetic reasons if it persists after 12 months.

Final diagnosis

Left abducens nerve palsy secondary to dural puncture.

Keywords: abducens nerve palsy; dural puncture

5 Dunbar SD, Katz KP. Failure of delayed epidural blood patching to correct persistent cranial nerve palsies. *Anesth Analg* 1994;79:806-7.

6 Chadwick D. The cranial nerves and special senses. In: Walton J, ed *Brian's diseases of the nervous system*, 10th edn. Oxford: Oxford Medical Publications, 1993.

7 King AJ, Stacey E, Stephenson G, Trimble R. Spontaneous recovery rates for unilateral sixth nerve palsies. *Eye* 1995;9:476-8.