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Postdural puncture headache : a review. J. DE COSTER, M.D. Dept. of Anesthesiology, University Hospitals, Catholic University, Leuven.

More than one hundred years ago Bier (1) published his experience of Post-Dural Puncture Headache (PDPH) after successful spinal anesthesia.

When the dura mater is punctured it is possible that the opening persists. This results in leakage of cerebrospinal fluid (CSF) and a headache. The most popular hypothesis explains this headache by the loss of CSF-support of the brain. In upright position the brain sags and there is traction on the cerebral structures, resulting in a painful neurovascular response of the meninges (2, 3). Another hypothesis states that when the body assumes a vertical position there is an increased leakage of CSF. The body tries to compensate the resulting loss of cerebral volume by vasodilatation, which causes the headache (3, 4).

The incidence of PDPH depends on the age and gender of the patient, and the design and size (5, 6) of the needle. A prospective study performed in obstetric patients in our institution found an incidence of 0.43% using 27 or 29 G pencilpoint needles (7).

One or three days after puncture the patients will complain of a mild-to-severe fronto-occipital headache. The pain is aggravated by the upright position and by straining (8). It can be associated with nausea and vomiting, stiffness of the neck, abducens nerve paralysis (9), photophobia, tinnitus, deafness (9) and hyperacusis (8, 11). When PDPH occurs other causes of headache must be excluded. These include postpartum dural venous thrombosis (10, 12), postpartum subdural hygroma (13), meningitis (12, 14), subdural hematoma (12), migraine (12), tension headache (9), subarachnoidal hemorrhage (12), preeclampsia (12), intrathecal air injected used for loss of resistance (15), and cerebral tumors (12).

Once the diagnosis of PDPH is secured, the patient should be kept normovolemic, because dehydration may cause a reduction in CSF-production. Mild PDPH can be treated symptomatically with non-steroidal anti-inflammatory drugs (NSAIDs) (5), while opioids can be used for severe PDPH. Relative bed rest is best subscribed because it relieves symptoms (5). Intravenous caffeine sodium benzoate has vasoconstrictive properties and can relieve symptoms (16). However, its use remains controversial. Preliminary data demonstrate a beneficial effect of intravenous cosyntropin (9), which can stimulate CSF-production.

Until today, the epidural blood patch remains the golden standard in the treatment of persistent PDPH. It

was first described in 1960 (17) and since the mid-1970s (18) it is currently used in adults. The epidurally injected blood creates a clot which will seal the tear in the dural membrane, and will facilitate its healing process. The CSF-hypotension will rapidly normalize and thereby reduce traction on brain and meningeal structures causing an almost immediate relief of symptoms (3). Failure of the bloodpatch occurs in 5% of all cases and is due to dislodgement or resolution of the clot before a final closure of the opening can occur and will lead to recurrence of the symptoms. The timing for performing an epidural blood patch is crucial. Some authors suggest that waiting for at least 72 hours after appearance of the symptoms, will increase the success rate (3, 19). Others have found an early blood patch gives more successful, and even the prophylactic use of an epidural blood patch has been advocated (20). The quantity of blood injected ranges from 3 ml (21) to 20 ml (22) of autologous blood. In children a volume of 0.3 ml/kg has been described (23). Once the epidural blood has been injected, it is essential the patient remains in a dorsal decubitus position for 1 or 2 hours (24).

Unfortunately, an epidural bloodpatch can cause some complications (23). Back pain (35%), neck pain, leg pain, paresthesias, radiculitis, fever, temporary nerve palsies and a second wet tap all have been described.

On rare occasions the epidural blood patch may fail or even be contraindicated. In these cases the epidural administration of fluids, such as dextran (25) or even saline (26) may be of help. The epidural injection of fibrin glue (27, 28, 29) may become an interesting alternative, but until further notice it remains experimental.

Finally, it has been shown that a rapid restoration of the CSF volume after a wet tap may decrease the incidence of PDPH (30). The immediate reinjection (if possible) of the drained CSF, followed by the insertion of a catheter in the subarachnoid space, the injection of 3 ml of normal saline through this catheter, and, use leaving the in place for 12-20 hours will reduce the incidence of PDPH to 14% (30). Leaving the subarachnoidal catheter in place for 24 hours will produce a further 30 fold decrease of PDPH (31). This may be related to an inflammatory process that facilitates closure of the dural puncture by platelet and fibrin attachment after catheter removal (31).

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