

BEDSIDE MONITORING OF CSF PRESSURE

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Cerebrospinal fluid (CSF) pressure¹ is measured either by inserting a needle into subarachnoid space or ventricle of the brain as a part of Intra Cranial Pressure (ICP) Monitor. Lumbar approach² to subarachnoid space is an easy method to monitor the CSF pressure using a spinal needle and a manometer. There are several indications to monitor CSF pressure such as diagnostic, therapeutic, ICP monitoring, internal hydrocephalus³ and for drainage of CSF. Contraindications are the marked ICP; patients with Glasgow Coma score less than four⁴; recent history of seizures; focal neurological deficit; coagulopathy⁵ and due to skin infection at the site of puncture.

A patient in our hospital was counseled before carrying out this procedure. The relative of the patient was explained about the procedure and its related complications. A written informed consent was also obtained. With all the aseptic precautions such as use of disposable spinal needle⁶, sterile tray and a central venous pressure (CVP) line procedure was carried out. For lumbar puncture, the patient was positioned laterally and curled to give a maximum lumbar spine flexion (Fig.1).



Fig. 1: Lumbar puncture

The patient's back was at the edge of the bed. A pillow under the head provided comfort and kept the spine in a horizontal plane. The shoulders, back and hips were perpendicular to the horizontal plane. Incorrect positioning is one of the most common reasons for an unsuccessful tap. Under strict aseptic⁷ precautions, the space was identified and with a wide bore needle (22g) the space was entered at an angle⁸ of 10°– 12° cephalad. Once the dura of spinal cord was punctured a “pop” sensation was felt. Then the stylet was removed and CSF flow was confirmed.

After obtaining free flow of CSF, pressure manometer used to measure CVP was attached to the spinal needle hub with a three-way stop-cock. It was held in position for a period of 3-4 min or when the column of fluid stayed still (Fig.2).



Fig. 2: CVP manometer

The reading was measured in cm of water. Normal CSF pressure values are: 10-18cm H₂O (8-15 mm Hg or 1.1-2 kPa) with the patient in lateral position and 20-30cm H₂O (16-24 mm Hg

or 2.1-3.2 kPa) with the patient in sitting position. CSF pressure value may show false reading if it is a bloody tap or if there is any kind of obstruction from the ventricle to the sub arachnoid space. In conclusion, it is a simple method of measuring ICP and can be employed at bedside with minimal equipment.

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