External lumbar cerebrospinal fluid drainage complications

1. infection

The most common complication is infection, and it may result in devastating consequences and negatively affect the outcome of these patients. The Infectious Diseases Society of America (IDSA), the Neurocritical Care Society (NCS), and The Society for Neuroscience in Anesthesiology & Critical Care (SNACC) have published recommendations for the management of EVD-Associated Ventriculitis. The overall quality of the published clinical practice guidelines is acceptable. However, continuous updates and external validation should be implemented [1)].

2. overdrainage usually as a result of the drainage bag being too low when using the pressure drainage method described above (either from falling to the floor, or not being raised when the patient sits or stands up) or from catheter disconnection.

Can cause:

a) subdural hematoma from tearing of bridging veins from downward displacement of the brain

b) headache

3. pneumocephalus: usually from placing the drain height below the site of a fistula, and air is drawn in through the fistula tract

a) tension pneumocephalus: usually with a ball-valve effect at the fistula site

4. catheter pull out: frequently occurs simply as a result of patient movement in bed or with patient transfers

Cerebrospinal fluid overdrainage and cerebrospinal fluid hypovolemia due to LD could induce severe fatal complications, which include transtentorial herniation and infratentorial hemorrhage.

The overall complication rate is found to be 44,4%. Overdrainage, pneumocephalus and meningitis are found to be the most severe complications, but most of these complications are reversible with early recognition.

Lumbar subarachnoid drainage is a safe method unless the development of any neurological findings should prompt rapid discontinuation of lumbar drainage and immediate radiographic evaluation [2)].

After extended endoscopic transsphenoidal approach

There is a paucity of high quality evidence regarding the routine placement of external lumbar cerebrospinal fluid drainage (LD) in reducing post-operative (op) Cerebrospinal fluid fistula after extended endoscopic transsphenoidal approach for anterior skull base lesions. In a study, Huo et al.

sought to compare the incidence of post-op cerebrospinal fluid fistula between patients with upfront LD insertion and those without it. This was a prospective randomized controlled trial conducted over a period of 5 years with patients undergoing extended endoscopic trans-sphenoidal surgery randomly assigned to either LD insertion at the time of surgery, or no LD placement. Thirty-eight patients with anterior skull base tumors were accrued from three tertiary hospitals of Melbourne. Post-op leak was confirmed by Beta-2 transferrin-positive rhinorrhea, and/or worsening pneumocephalus on brain imaging. Skull base defect size and pedicled nasoseptal flap viability were assessed on post-op CT and MRI, respectively. There was no significant difference in post-op Cerebrospinal fluid fistula incidence between the two subgroups (12.50% in LD arm vs. 9.10% in no LD arm). Patients with external lumbar cerebrospinal fluid drainage insertion however, demonstrated substantially raised complication rates, longer hospital lengths of stay and lower subjective quality of life measures at 12 months compared with those without LD. In conclusion, routine placement of LD at the time of surgery for extended anterior skull base trans-nasal approach did not reduce the risk of post-op Cerebrospinal fluid fistula. Discretion is warranted when using external lumbar cerebrospinal fluid drainage as an adjunct due to its associated morbidities, prolonged hospital stay and adverse effect on patients' subjective outcome measures [3].

External lumbar cerebrospinal fluid drainage occlusion

External lumbar cerebrospinal fluid drainage occlusion

1)
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2)
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3)
Huo CW, King J, Goldschlager T, Dixon B, Chen Zhao Y, Uren B, Wang YY. The effects of cerebrospinal fluid (CSF) diversion on post-operative Cerebrospinal fluid fistula following extended endoscopic anterior skull base surgery. J Clin Neurosci. 2022 Feb 18;98:194-202. doi: 10.1016/j.jocn.2022.02.006. Epub ahead of print. PMID: 35189544.