ABSTRACT

Title: Lumbar subarachnoid drains for CSF drainage in pituitary surgery: Technical difficulties and complications – An observational study

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Context: Lumbar drains are commonly used for intra-operative CSF (cerebrospinal fluid) diversion, both as a prophylactic measure and therapeutic measure in the presence of CSF leak in trans-nasal trans-sphenoidal pituitary surgery. The documented risk of complication with the use of lumbar drains is 8%. Although generally considered safe, lumbar drain insertion increases the length of hospitalization, causes major and minor complications such as headache, backache, meningitis, radiculopathy, retained catheter fragments and patient discomfort. It has been shown that perioperative lumbar drain insertion for CSF diversion decreases the overall risk of post-operative CSF leaks. The studies that have been performed, regularly use the specifically designed lumbar drain kit such as the Codman lumbar drain kit. Owing to the unavailability and unaffordability of the same in our setting, we regularly use the epidural kit for placing lumbar drains. This is often associated with difficulty in CSF drainage.
Since the diversion of CSF, is the key to successful surgery, we would like to see if the use of epidural kit for this purpose is associated with a higher incidence of difficult placement and unsuccessful CSF drainage and complications.

**Aim:**

To study the technical difficulties faced during lumbar subarachnoid drain placement and the complications associated with the lumbar drain.

**Objectives:**

1. To assess the incidence of complications associated with pre-operative lumbar drain placement in endoscopic pituitary surgery

2. To study the incidences of difficulties observed with lumbar CSF drain catheter placement with the epidural catheter set.

3. To study the incidence of difficulty in intra-operative CSF drainage following successful lumbar drain placement with the epidural catheter set.

4. To study the manoeuvres attempted to improve intra-operative CSF drainage.

**Study Design:** Prospective observational study

**Materials and Methods:** All Neurosurgery unit 1 patients, who underwent trans-nasal trans-sphenoidal resection of pituitary tumours, and required pre-operative lumbar drain placement as planned by the neurosurgeon, were recruited for the study. The department
of Neurosurgery unit 2, does not routinely place lumbar drains as per their protocol for trans-nasal trans-sphenoidal surgery. A detailed patient information sheet was provided to the subjects and the primary investigator explained the technique and need for placement of the lumbar drain. Informed consent was then obtained from the subject. The technique of lumbar drain placement was decided upon by the concerned anaesthesiologist at the time of surgery. The other intra-operative details were also filled by the concerned anaesthesiologist in the proforma sheet. The patient was followed up post-operatively by the primary investigator, up to one day after completion of the surgery. The incidence of complications of lumbar drain placement, difficulty in placement, difficulty in drainage of CSF and the manoeuvres to improve the lumbar CSF drainage were assessed. The volume of CSF drained, presence or absence of CSF leak and the operative conditions, as assessed by the surgeon, were also noted. The data was analysed to arrive at the results.

**Conclusion:** The complications observed were headache, backache and an increase in the duration of hospitalisation. Difficulty in tapping the lumbar space, citing the lumbar drain catheter and drainage of cerebrospinal fluid was also observed.

Although lumbar subarachnoid drain placement for pituitary surgery is associated with only minimal complications, there is an unacceptably high rate of difficulties in placement and lumbar subarachnoid drain failure rates.

**Keywords:** lumbar subarachnoid drains, pituitary surgery, epidural kit, technical difficulties, complications.