Management of CSF Rhinorrhea: A Review

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ABSTRACT—Treating a Cerebrospinal fluid leak is exigent and contentious. Many authors have given their opinions regarding the management of CSF leak. Prophylactic antibiotics happened to minimise the risk of meningitis or local infections while the conservative management. Life threatening complications demands for surgical repair of CSF leak. It was after World War I, trauma became the chief cause of CSF rhinorrhoea. It was after World War I, trauma became the chief cause of CSF rhinorrhoea.

I. INTRODUCTION—
Galen was the first person to elucidate the concept of Cerebrospinal fluid rhinorrhea in the second century AD. He hypothesized that CSF was released into the nose through ethmoid and pituitary regions. The first group of patients who were detected with CSF leak was set forth by Saintclair in the year 1899. But the first successful repair of CSF rhinorrhoea was put out by Dandy in 1926. Before World War I, CSF rhinorrhoea was mostly thought to be of nontraumatic origin because the patients with the head injuries hardly put through long time enough to evolve as CSF rhinorrhoea. It was after World War I, trauma became the chief cause of CSF rhinorrhoea.

The management of CSF rhinorrhoea depends on the cause of CSF leak. CSF rhinorrhoea can be categorised as Traumatic, Nontraumatic, Spontaneous and Iatrogenic. CSF leak due to traumatic causes can be further classified as planned surgical or unplanned surgical and nonsurgical. Accidental traumatic causes for 70% - 80% of cases of CSF rhinorrhoea.

II. DISCUSSION—
The main focus of conduct of cerebrospinal fluid escape is localisation of defect in the dura. This defect may spring from any part of the cranial fossae. Collective image studies happen to identify locations of defects of dura. The relevance of these studies depend on various factors such as population, size of the defect, interpretation by the operator, and flow rate of the leak. Multiple imaging studies include High-resolution coronal and axial CT, CT cisternogram, Radionuclide cisternogram, Intrathecal fluorescein, MRI and MR Cisternography.

CONSERVATIVE MANAGEMENT—CSF leaks takes over 7 to 10 days from trauma either accidental or surgical to heal conservatively. It takes number of days or few weeks after trauma, huge leaks or normal pressure cerebrospinal fluid leaks to develop as CSF rhinorrhoea. Cherry picked treatment includes bed rest and head raise (15-30 degrees), refuse to any straining activity and the use of laxatives. Antibiotic prophylaxis is still contentious to reduce development of resistant
organism. Antibiotic prophylaxis comes into role when a contamination is along a fluid pathway. A leak of CSF caused when there is an increase in the intracranial pressure will solve when intracranial pressure is almost normal. The use of diuretics helps decreasing the intracranial pressures. Leaks which are adamant on decreasing when the intracranial pressures gets normal are suggestive for surgical procedure.

SURGICAL MANAGEMENT- There is a number of factors that are involved in surgical management. It includes use of drain (lumber), the path for repair of the leak, the kind of graft or flap it requires for along with the use of the grafts or flaps, and infliction of sealant and anterior or posterior nasal packing.

LUMBAR DRAIN- The employ of a drain is still a controversial choice. It is also contentious about the use of a drain mostly, subarachnoid lumber or consecutive lumber punctures as lumber drainage has been a risk. And over drainage may create a resultant pneumocephalus. There might an increase in the intracranial pressure on the use of the lumber drain, which warrants a risk of recurrence. Other issues include headache, nausea, vocal cord paralysis, vomiting, occlusion of the posterior cerebral artery, and lumber radiculopathy.

SURGICAL APPROACHES-

TRANSCRANIAL APPROACH- A triumphant mend of a cerebrospinal leak using an open methodology was first done by Dandy 1929. And the success rate ranges from 60% to 95%. Superiority of this approach includes better uncovering, ability to recognize manifold flaw, and potential to block a discharge in a highly pressuredsituation.

EXTRACRANIAL APPROACH- First documentation was by Dohlman in the year 1948. Overall success rate has been noted as 97% and 86% on commencing surgical treatment. Reduced morbidity, no loss of smell, ameliorated endonasal exposure of the sinuses such as sphenoid, parasellar and posterior ethmoid, cribiform plate, and the posterior wall of the frontal sinus was seen. This procedure can be quite cumbersome and there is risk for facial deadness, and orbital complications.

TRANSNASAL APPROACH- Hirsch explained about this approach in 1952. Lehrer and Deutsch refined envision by microscope. It includes risks like numbness of face as well as septal perforation.

ENDOSCOPIC APPROACH-Wigand narrated closing down of a cerebrospinal fistula with the use of an endoscopic application in the year 1981. It has better rate of success and lesser rate of morbidity than surgical repair. Hence it is a preferred approach these days.

SEALANT- Fibrin is the mostly used sealant in this day which is an amalgamation of Fibrinogen, Thrombin, and Ca cofactor. This provides a non-permanent closure and fabricates an added roadblock to CSF leakage at the time of healing of wound and fibrosis.

PACKING-Packing materials includes absorbable and nonabsorbable. The type of material used for pack to be used is the surgeon’s option.

FOLLOW UP-The possibility of the normal sinus drainage to be blocked when repair of the defect is at the proximity of a sinus outflow tract. Postoperative follow-up to rule out occurrence of any retention cysts when his perturb for blockage is done by proper CT scan.

III. CONCLUSION-

Advancement in imaging and endoscopic techniques have refined the potentiality to identify, localize, and manage CSF leaks in least ghoulish way of the anterior skull base. The method of leakage and the correlation between cerebrospinal fluid production and immersion should be taken into note when individualizing a repair. Increased fluid pressure seeded by moreproduction or lessabsorption might give rise to tenacity of a leak despite complete management. Advancements in grafts (replacement of Dura) and sealants of tissues haveded to betterment of the performance for watertight closure of the vault.

REFERENCES


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