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RESEARCH ARTICLE

A CASE SERIES ON MANAGEMENT OF SPONTANEOUS CEREBROSPINAL FLUID RHINORRHEA

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Spontaneous Cerebrospinal Fluid Rhinorrhea, Endoscopy, Transnasal Repair

Abstract

Introduction: Cerebrospinal fluid (CSF) rhinorrhea is defined as leakage of cerebrospinal fluid that occurs from a direct communication between the CSF-containing subarachnoid space and the paranasal sinuses. Non traumatic or spontaneous CSF rhinorrhea is very rare and reported to have occurred in only 4% of the CSF leak cases.

Materials and Methods: A retrospective hospital-based study was conducted in a tertiary care centre on seven cases of spontaneous CSF Rhinorrhea.

Observation and Results: Among seven cases, five patients were of age less than 45 years and two patients were more than 45 years old. All subjects were females and were diagnosed with spontaneous CSF rhinorrhea. CT paranasal sinuses and CT Cisternogram were the most common imaging modalities used for diagnosis in all patients. All patients underwent Transnasal endoscopic repair of CSF rhinorrhea.

Conclusion: Transnasal endoscopic repair of the defect gives a successful outcome following failure of the conservative management in spontaneous CSF rhinorrhea.

Introduction:-

Cerebrospinal fluid (CSF) rhinorrhea is defined as leakage of cerebrospinal fluid that occurs from a direct communication between the CSF-containing subarachnoid space and the mucosalized space of the paranasal sinuses. [1] As it serve as a path for the spread of bacterial pathogens and other microorganisms, CSF rhinorrhea may lead to meningitis and intracranial infections. CSF rhinorrhea can be classified into traumatic and atraumatic. [2] Only 4% of all CSF leaks are non-traumatic. Although the concept of CSF rhinorrhea is simple, its diagnosis and localization may be troublesome. Various approaches have been described for the repair of CSF rhinorrhea, including intracranial approach, [3] extra cranial approaches [4, 5] and endoscopic approach. [6] Prompt management and repair of all CSF rhinorrhea cases should be attempted in order to avoid potential complications.

Aim And Objectives:-

1. To evaluate the role of pre-operative CT Cisternogram in the diagnosis of CSF Rhinorrhea.
2. To evaluate the role of transnasal endoscopic repair in spontaneous CSF Rhinorrhea.

Materials And Methods:-

A retrospective hospital based study was conducted in a tertiary care centre on patients with CSF rhinorrhea. A total of seven patients were included in this study.

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All patients presented with complaints of watery nasal discharge without any history of trauma or any previous surgeries. They were evaluated using history, clinical examination, complete blood count, renal and liver function, coagulation profile and blood grouping. Routine chest X-ray and ECG were done. CT brain, CT PNS and CT cisternogram /MR Cisternogram were also performed.

Patients with specific medical comorbidity were evaluated accordingly. Patients also underwent fundus examination.

All patients were given intravenous (IV) broad-spectrum antibiotics and acetazolamide 250 mg bid dosage. In conservative treatment, patients were kept in supine position, given stool softener, and advised to avoid unnecessary straining. Patients were evaluated for routine vitals and signs of meningitis.

The age distribution of study sample is as given in Figure 1.

Figure 1. AGE DISTRIBUTION

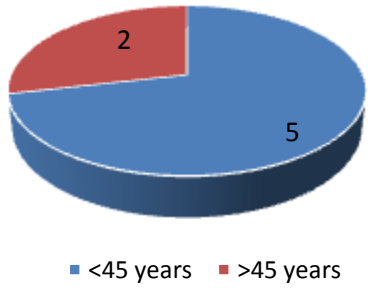
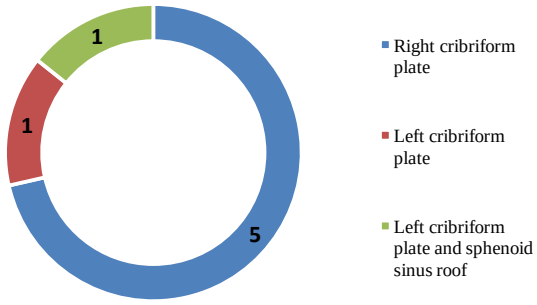


Figure 2. SITE OF CSF LEAK



All subjects were females and were diagnosed with spontaneous CSF rhinorrhea.

CT paranasal sinuses and CT Cisternogram were the most common imaging modalities used for diagnosis in all patients. Site of CSF Leak was identified to be the right cribriform plate in five patients, left cribriform plate in one patient and two defects were noted (left cribriform plate and sphenoid sinus roof) in the seventh patient. (Figure 2)

All patients underwent Transnasal endoscopic repair of CSF rhinorrhea and the postoperative period was uneventful. The graft materials used in closure of CSF leak were fat plug, temporalis fascia graft, middle turbinate mucosa, surgicel and gelfoam. Three out of seven patients underwent a lumbar drain placement postoperatively.

All patients were on regular follow-up for 6 months.

Figure 3:- CT cisternogram showing left cribriform plate leak.

Discussion:-

Cerebrospinal fluid (CSF) rhinorrhea is leakage of cerebrospinal fluid through any direct communication between the CSF-containing subarachnoid space and the paranasal sinuses. Data about the incidence of CSF rhinorrhea are sparse. Non traumatic or spontaneous CSF rhinorrhea is very rare and reported to have occurred in only 4% of the CSF leak cases. Non traumatic spontaneous CSF leak is rare condition and mostly seen in middle aged obese females. [7]There are studies that demonstrated an increased incidence of elevated body mass index among spontaneous CSF rhinorrhea patients.

High-resolution CT and MRI of the skull base and brain are important radiological investigations that differentiate between spontaneous and traumatic CSF rhinorrhea. They also provide adequate anatomic information about the integrity of the skull base. CT/MR cisternogram provides information on the location of CSF leak, size of the defect and amount of the leak. [8] In the study by Shetty P.G et al, a combination of MR cisternography and plain high-resolution CT have been reported to be more accurate in detecting the site and extent of CSF rhinorrhea. [9] Since it is an invasive procedure, the usage of cisternogram is limited if CT/MRI localises the defect. A review of literature demonstrates that the most common location of spontaneous CSF leaks documented so far are the cribriform plate and the lateral recess of the sphenoid sinus. [10,11]

There are studies that show the importance of beta-2 transferrin estimation as an investigation of choice when CSF leak is suspected in a patient. It is a noninvasive test which is also sensitive and specific. [12]

Many CSF leaks, especially traumatic, respond to conservative management. That includes avoiding activities like coughing, sneezing, and straining that are likely to increase the intracranial pressure, head end elevation, diuretics like acetazolamide, prophylactic antibiotics and lumbar drainage. In contrast, non-traumatic CSF rhinorrhea is likely to require direct operative repair. Early surgical repair is warranted for definitive management of these patients. The current recommendations suggests initial treatment of CSF leaks using endoscopic repair, with extra cranial repair reserved if indicated or with failure of endoscopic repair.

Management of CSF rhinorrhea by an intracranial approach carries morbidity and failure rates of 20 to 40 %. [13] Whereas, an endoscopic approach is less morbid and has a success rate of 90 to 100%. [14]

Conclusion:-

CSF rhinorrhea is drainage of CSF from the intracranial space into the nose and paranasal sinuses, in the presence of a skull base defect. Spontaneous CSF rhinorrhea constitutes only about 4% of all cases. CT/MR cisternogram is a useful radiological tool to diagnose CSF rhinorrhea and to locate the site of leak in such cases. Transnasal endoscopic repair of the defect gives a successful outcome following failure of the conservative management in spontaneous CSF rhinorrhea.

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