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Original Research Article

The study of management of cerebrospinal fluid rhinorrhea at tertiary care center

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ABSTRACT

Background: CSF Rhinorrhea is clinically emergency condition in Otorhinolaryngology. Patients were presented with unilateral watery nasal discharge. In the evolving world, CSF leak repair done via endoscopic method. Recurrence is very less with endoscopic repair method of CSF leak.
Methods: We took complete history, complete Ear, Nose, Throat and Head and Neck examination, Endoscopic examination of nasal cavity followed by Radiological test in the form of MR Cisternography. Depending upon the site of leak, CSF leak repair done via endoscopic method of overlay and underlay and with the help of fascia, fat, surgical, flap, fibrin glue and cartilage.
Results: Total 30 cases analysed where 63.33% & 26.67% patients have defect at cribriform plate & fovea ethmoidal is respectively. 63.33% patients are male, almost all patients are adults. 73.33% are spontaneous & rest are traumatic, 43.33% have circular defect, 36.67% have horizontal defect, 53.33% are treated with fat, surgical, fascia, fibrin glue, 40% are treated with above-mentioned things with flap, 6.67% patients are treated with above-mentioned things with cartilage.
Conclusions: Most of CSF leak are spontaneous in nature, most of patients had defect in cribriform plate that too in anterior portion of the plate, almost all patients were adults, more females had defect than males, circular defects are slightly more common than horizontal ones, and most of the patients didn't need flap or cartilage during surgery

Keywords: Lateral lamella, Cribriformplate, Endoscopic

INTRODUCTION

As in this era of sedentary lifestyle, spontaneous CSF leak is known to be new entity to the world. As Minute injuries to Major inadvertent trauma over head and neck can also lead to CSF leak.[1] The cerebrospinal fluid (CSF) is a vital fluid that surrounds and protects the brain and spinal cord. It plays a crucial role in maintaining the optimal functioning of the central nervous system (CNS) by providing mechanical support, buoyancy, and metabolic exchange.[2] Under normal circumstances, CSF is contained within the protective layers of the meninges, but sometimes, due to various factors, a breach in this protective barrier can occur, leading to a CSF leak. CSF leaks can be defined as abnormal communications between the subarachnoid space, where CSF circulates, and the extracranial or spinal spaces. These leaks can manifest through various sites, such as the skull base, spine, or middle ear, and can result from traumatic injuries, congenital malformations, surgical complications, or underlying medical conditions.[4-5] CSF leaks pose a significant clinical challenge as they can lead

to various neurological complications and significantly impact a patient's quality of life.[6] Understanding the pathophysiology of CSF leaks is crucial in comprehending the mechanisms behind their occurrence and associated complications. The CSF leak disrupts the physiological equilibrium, leading to a reduction in CSF volume and subsequent decrease in intracranial pressure.[8] This disruption can result in the descent of the brain, leading to traction on pain-sensitive structures and causing headaches, visual disturbances, and other neurological symptoms.[1] The diagnosis of CSF leaks requires a multidisciplinary approach involving clinical evaluation, radiological imaging, and laboratory analysis of the CSF.[3] Clinical manifestations may vary, depending on the site and extent of the leak, and can include clear rhino rhea, otorrhea, or less specific symptoms such as postural headaches, nausea, and cognitive changes. Advanced imaging techniques, such as computed tomography (CT) cisternography, magnetic resonance imaging (MRI), and radionuclide cisternography, aid in localizing the site of CSF leakage and identifying the underlying cause.[4]

Once diagnosed, appropriate management strategies can be implemented to address CSF leaks effectively. Conservative management options include bed rest, head elevation, and avoidance of activities that increase intracranial pressure. However, in cases where conservative measures are ineffective or when the leak is associated with significant morbidity, surgical interventions become necessary. Surgical repair techniques range from traditional open approaches to minimally invasive endoscopic procedures, each tailored to the specific site and characteristics of the CSF leak.[7] This comprehensive review aims to provide a thorough understanding of CSF leaks, encompassing their pathophysiology, clinical presentation, diagnostic methods, and management strategies. By exploring the existing literature, this paper will consolidate current knowledge on CSF leaks and serve as a valuable resource for healthcare professionals involved in the care of patients with CSF leaks. Additionally, it may also identify gaps in knowledge and highlight areas that require further research to optimize the diagnosis and treatment of this challenging condition.

METHODS

Study design, location and duration

Current study was a nonrandomized control trial conducted at GMERS medical college and hospital Sola Ahmedabad, in department of otorhinolaryngology from March 2020 to March 2023.

Inclusion criteria

Inclusion criteria were; Patient of any age group with confirmed CSF leakage/ bony defect found in CT/MR study suffering from ANY of the following: Patient presented with traumatic head injury and has CSF rhinorrhea. Patient had past history of head trauma and presented with CSF rhinorrhea. Patient with spontaneous CSF rhinorrhea. Patient previously operated for other pathology and presented with postoperative CSF rhinorrhea.

Exclusion criteria

Exclusion criteria was Patients with no CSF leakage or bony defect found in CT/MR study.

All the case of CSF Rhinorrhea came in GMERS Medical College and Hospital Sola Ahmedabad were selected for the study. Oral and written consent was taken from all the participants and they will inform that they can leave the study at any time during the study. Total 30 cases came to GMERS Medical College and Hospital, Sola, Ahmedabad. In our Department of Otorhinolaryngology, we took complete history, complete Ear, Nose, Throat and Head and Neck examination, Endoscopic examination of nasal cavity followed by Radiological test in the form of MR Cisternography. Depending upon the site of leak CSF leak repair done via endoscopic method of overlay and underlay and with the help of fascia, fat, surgical, flap, fibrin glue and cartilage.

RESULTS

Total 30 cases came to GMERS medical college and hospital, Sola, Ahmedabad of CSF rhinorrhea. Out of 30 cases, 19 patients had defect at Cribriform plate, 8 patients had defect at fovea ethmoidalis, 2 patient had defect at junction of posterior ethmoid and sphenoid, 1 patient had defect at lateral recess (Figure 1).

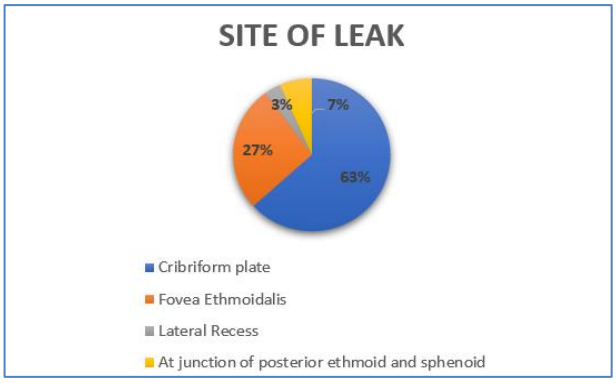

Figure 1: Site of CSF leak.

Out of 30 patients, 19 are female and 11 patients are female (Figure 2). Out of 30 patients, 29 patients were adult and 1 patient was child (Figure 3). Out of 30 patients, 22 patients were spontaneous in nature and 8 patients were traumatic in nature (Figure 4). Out of 19 patients of cribriform plate defect, 11 patients had defect at anterior portion of cribriform plate, 4 patients had defect at posterior part of cribriform plate and 4 patients had defect at lateral lamella (Figure 5).

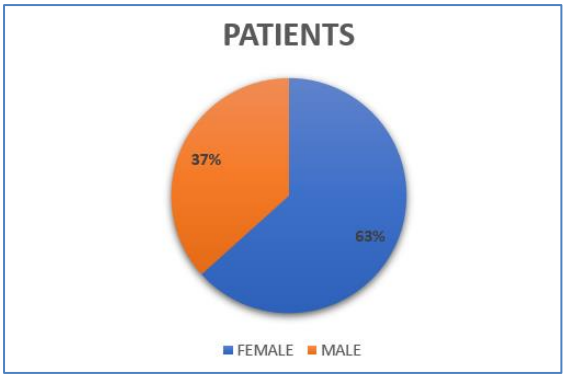

Figure 2: Gender of patients.

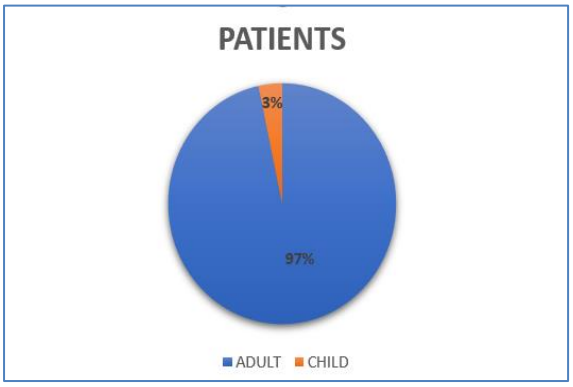

Figure 3: Age group of patients.

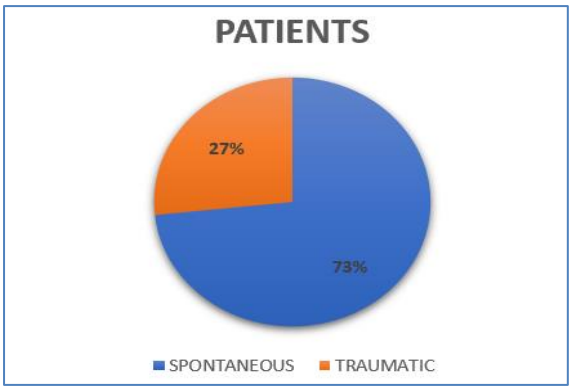

Figure 4: Nature of defect.

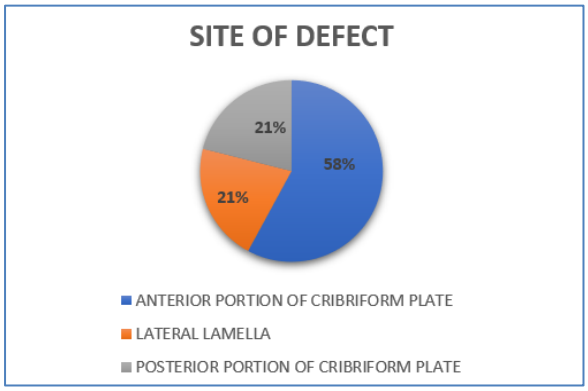

Figure 5: Exact site in cribriform plate defect.

Out of 30 patients, 13 patients had circular defect, 11 patients had horizontal defect and 6 patients had pinpoint defect (Figure 6). Out of 30 patients, 16 patients were treated with fat, surgical, fascia and fibrin glue, 12 patients treated with fat surgicel, fascia, flap and fibrin glue and 2 patients treated with fat surgical fascia, fibrin glue and cartilage (Figure 7).

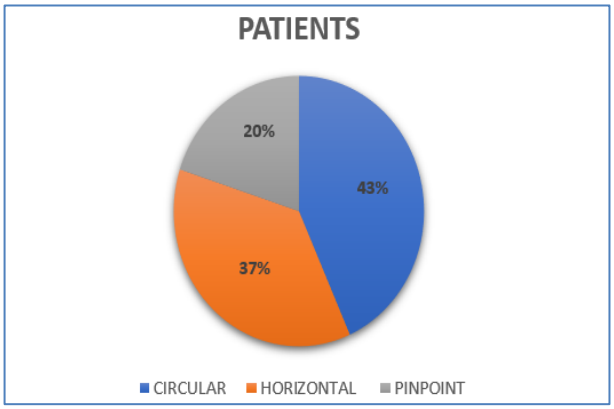

Figure 6: Shape of defect.

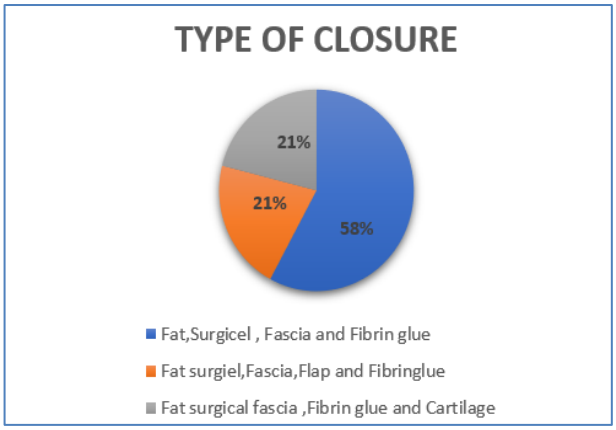

Figure 7: Type of closure.

DISCUSSION

Total 30 cases of CSF rhinorrhea came to GMERS Medical College and Hospital, Sola, Ahmedabad. 63.33% & 26.67% patients have defect at cribriform plate & fovea ethmoidal is respectively. 63.33% patients are male, almost all patients are adults. 73.33% are spontaneous & rest are traumatic. 43.33% have circular defect, 36.67% have horizontal defect. 53.33% are treated with fat, surgical, fascia, fibrin glue, 40% are treated with above-mentioned things with flap, and 6.67% patients are treated with above-mentioned things with cartilage. Surgical repair of skull base CSF Leaks after cisternography Diagnosis: Analysis of Validity and Surgical Outcome and Impact on Future Treatment Strategies done by Kraus et al they had done study shows total of 63 cisternography examinations followed by surgery were performed in 53 patients, 27 were female and 26 were male. The etiology of CSF leaks was

traumatic in 30.2% (19 procedures in 14 patients), spontaneous in 36.5% (23 procedures in 20 patients), and iatrogenic in 33.3%. Depending on the defect localization and extent, as well as on the previous history, a transcranial approach was chosen in 66.7% and an endonasal approach in 33.3%. As compared to this study, our study had 19 were female and 11 patients were male. In all the cases were treated with endoscopic method.[2] Outcomes of transnasal endoscopic repair of cerebrospinal fluid leaks: a prospective cohort study done by Baban et al they had done study shows Twenty-one patients were enrolled in the study; 12 out of 21 were females with a higher prevalence of traumatic causes of 61.9%. As compared to this, ourstudy had 19 were female and 11 patients were male. Out of 30 patients, 22 patients were spontaneous in nature and 8 patients were traumatic in nature.[1] Endoscopic management of frontal sinus CSF leaks done by Gâta, et al a total of twenty-two patients in which 15 male and 7 female patients. A history of trauma was recorded in 17 patients (77.2%), whereas 5 patients presented spontaneous CSF leak. All patients presented with CSF rhinorheea. As compared to this, our study had 19 were female and 11 patients were male. Out of 30 patients, 22 patients were spontaneous in nature and 8 patients were traumatic in nature.[3]

Limitations

Limitation of current study was sample size is relatively smaller.

CONCLUSION

Most of CSF leak are spontaneous in nature, Most of patients had defect in cribriform plate & that too in anterior portion of the plate, almost all patients were adults, More Females had defect than males, Circular defects are slightly more common than Horizontal ones, and Most of the patients didn't need flap or cartilage during surgery.

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