Case report

Case report: Recurrent spontaneous cerebrospinal fluid (CSF) leak

Bashayer Salem Alsaeedi *, Hussein Ali Alzamel, Ahmad Rasheed Alrasheedi, Imtiyaz Nawaz Bhat

ENT Department, Al-Farwaniya Hospital, Al-Farwaniya, Kuwait

ARTICLE INFO

Keywords:
CSF leak
Intracranial pressure
Spontaneous
Skull base
Case report

ABSTRACT

Introduction and importance: Obese, middle age, females, and increased intracranial pressure is the commonest predisposing factors for spontaneous cerebrospinal fluid.

Case presentation: Here we present a middle-aged female presented 1 year ago with right sided CSF Leak the confirmed by Beta 2 Transferrin and CT scan and repair have been done. Now she presented with the same complains in the left side.

Conclusion: Proper management of increased intracranial pressure must be done pre and post skull base repair to prevent recurrence either in the same side or the opposite side.

1. Introduction

Cerebrospinal Fluid (CSF) is a clear aqueous solution that, compared with plasma, contains higher concentrations of sodium, chloride, and magnesium and lower concentrations of glucose, proteins, amino acids, uric acid, potassium, bicarbonate, calcium, and phosphate. Cerebrospinal fluid (CSF) leak describes the discharge of CSF from the intracranial cavity through an osseous defect(s) within the mucosa, skull base and meningeal membrane [1].

Defects in skull base may occur congenitally, due to trauma, neoplasm, and occasionally it is happened spontaneously [2]. Spontaneous cerebrospinal fluid has not been fully understood. However, it is mostly associated with increased intracranial hypertension [2–4]. Nowadays Repair of CSF Leak mostly done endoscopically through the nose to decrease the complication of open approach [5–8]. Repair must be done to avoid life-threatening squeals such as: ascending meningitis, brain abscess [9–11].

Here we present a 47-year-old Pilipino lady how underwent repair of spontaneous CSF leak on the right side in Al-Farwaniya Hospital, Kuwait. Now she presents to Al-Farwaniya Hospital ORL-HNS outpatient department with CSF rhinorrhea on the left side.

This work has been reported in line with SCARE 2020 criteria [12].

2. Case report

A 45-year-old Sri Lankan lady, overweight, known case of uncontrolled hypertension on concor. Presented in January 2021 to Al-Farwaniya Hospital, ENT outpatient department complaining of right side clear watery rhinorrhea, that increase when leaning forward. No history of trauma nor nasal surgery. The patient also described salty, metallic taste when this secretion drains back to her throat. No headache. No Diplopia, nor visual disturbance, no photophobia nor phonophobia. No neck rigidity.

Fiberoptic nasal scope Showed right side pale mucosa with watery secretion all over the right nasal cavity, no skull base defect observed. The left side examination was unremarkable. Beta transferrin Sent for analysis of this fluid and came as positive.

CT Sinus Scan Showed Suspected bony defect at the right aspect of the cribriform plate of ethmoid, measuring about 2.5 mm with partial opacification of the right ethmoidal air cells by soft tissue/fluid density (seen at its anterior cells), for further MRI with. And partially empty Sella (Figs. 1 and 2).

MRI confirmed right fronto-medial meningocele and enlarged Sella turcica.

Patient admitted as a case of Cerebrospinal fluid leak for repair of the skull base defect. Surgery done in Al-Farwaniya Hospital 18th of January 2021 by ENT consultants and specialists.

- The Patient Was Prepped and Draped in A Standard Sterile Fashion Fess Done, Right Maxillary, Anterior + Posterior Ethmoids + Frontal + Sphenoid Sinuses Opened and Cleared.
- Meningocele + Skull Base Defect Identified.
- Abdominal Fat Graft Harvested and Used to Seal the Defect in A

* Corresponding author.
E-mail address: bashayeralsaediii@gmail.com (B.S. Alsaeedi).

https://doi.org/10.1016/j.ijscr.2022.107739

Received 3 September 2022; Received in revised form 4 October 2022; Accepted 9 October 2022

Available online 13 October 2022

2210-2612/© 2022 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
3. Discussion

The etiology of spontaneous cerebrospinal leak is still not fully understood. However, increased intracranial pressure could be contributing factor for spontaneous CSF rhinorrhea [1,3,13,14]. Although endoscopic repair can achieve almost 90% success rate for CSF leak, the success rate for spontaneous cerebrospinal fluid leak was much worse [15]. Previous studies have shown that intracranial pressure elevation after successful surgical repair accounts for the recurrence [16]. Once the skull base defect closed and the CSF leak to the nasal cavity no more exists the intracranial pressure will tend to increase. Previous studies conclude that decreasing intracranial pressure can improve the success rate and prevent the recurrence of cerebrospinal fluid leak either in the same site or to the other site as in our case report [17-19].

Control of elevated ICP may be achieved by various methods, treatments with acetazolamide, permanent CSF diversion via a ventriculo-peritoneal shunt, decreased body weight by diet or bariatric surgery, or serial lumbar punctures [20-23]. The success rate of CSF repair followed by control intracranial hypertension is very high. However, here is still some debate considering management of elevated ICP in patients with spontaneous CSF leaks [5]. The main concern are the adverse effects, Acetazolamide is a carbonic anhydrase inhibitor that may cause electrolyte and metabolic disturbances [22]. VP shunt is an invasive cranial procedure that carries the risk of surgical site infections, meningitis and blockage, and migration of distal catheter. The other concern is the lack of evidence of their efficacy [5,24].

Our patient is obese, middle-aged female, this tend to be a predisposing factor for increased intracranial pressure as per previous studies [4,5,25]. The rates of spontaneous CSF leak in the US may be increased up to 2.5-fold in high obesity regions, with correlations also found between sleep apnea and hypertension in patients with CSF leak [4,26]. Although the presentation of CSF leak is some time obvious regarding the patient history and it’s need only a positive beta-2-transferrin to confirm the diagnosis [27-30], computed tomography (CT), Intrathecal fluorescein is needed to detect the location, size, and number of skull base defect prior to surgery [31-34].

4. Conclusion

Spontaneous CSF leaks are rare and challenging. It is always requiring surgical intervention to avoid CSF leak complication. Spontaneous CSF leak happens mostly due to increased intracranial hypertension in obese, middle-aged females. Therefor treating intracranial hypertension post-surgical repair are mandatory to increase the successes rate and avoid recurrence.

Ethical approval

Not declared.

Funding

This work did not receive any grant from funding agencies in the public, commercial, or not-for-profit stories.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of written consent is available for review by the Editor-in-Chief of this journal in request.

Research registry

Not applicable.

Guarantor

Dr. Bashayer Alsaeedi.

Provenance and peer review

Not commissioned, externally peer review.
CRediT authorship contribution statement

All authors contributed toward data analysis, drafting, and revising the paper, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Declaration of competing interest

There is no conflict of interest to declare by any of the authors of this study.

References

[1] I. Monjas-Cano, I. Belinchon-Romero, J.R. Gras-Albert, G. Gonzalez-Alcaide, J. M. Ramos-Rincon, Top-cited articles in cerebrospinal fluid leak (rhinorrhea and otorrhea) (1945-2018), Braz. J. Otorhinolaryngol 87 (5) (2021).
[2] V. Subramaniam, S. Ganapathy, S. Shivananda, K.N. Nagabhushan, R. Murthy, Recurrent spontaneous bilateral subdural hemorrhage as a consequence of high-cervical spontaneous CSF Leak—Lessons for neurosurgeons. Indian. J. Neurosurg. 10 (01) (2021).
[3] D.T. Nguyen, M. Helleringer, O. Klein, C. Rumeau, The relationship between spontaneous cerebrospinal fluid leak and idiopathic intracranial hypertension, Eur. Ann. Otorhinolaryngol. 138 (2021). Head and Neck Disease.
[4] R.F. Nelson, B.J. Gantz, M.R. Hansen, The rising incidence of spontaneous cerebrospinal fluid leaks in the United States and the association with obesity and obstructive sleep apnea, Otolaryngology and Neurotology. 36 (3) (2015).
[5] B.C. Lobo, M.M. Baumanis, R.F. Nelson, Surgical repair of spontaneous cerebrospinal fluid leaks (CSF leaks): a systematic review. Laryngoscope investigative, Otolaryngology 2 (2017).
[6] V. Sanzindras, N. Mathew, A.K. Shabna, B. Harikrishan, Spontaneous medial cribiform CSF leak: endoscopic surgical repair with free mucosal Graft—Our experience. Indian journal of otolaryngology and head and neck, Surgery 70 (3) (2018).
[7] A.Y. Soliman, K. Ebeid, A.A. Elfailde, Recurrent spontaneous CSF rhinorrhea: combined endo-nasal endoscopic repair with lumbo-peritoneal shunt insertion, Egyptian J. eurol., Psychiatry and Neurosurgery. 57 (1) (2021).
[8] D.C. Kreatsoulas, V.S. Shah, B.A. Otto, R.L. Carrau, D.M. Prevedello, D.A. Hardesty, A.Y. Soliman, K. Ebeid, A.A. Elfadle, Recurrent spontaneous CSF rhinorrhea: a systematic review. Laryngoscope investigative, Otolaryngology-head and neck, Surgery 143 (2_suppl) (2010).
[9] O.L. Pfahl, D.C. Kreatsoulas, R.L. Carrau, K.E. Rosenthal, A.Y. Soliman, K. Ebeid, A.A. Elfadle, Spontaneous CSF rhinorrhea: a systematic review. Laryngoscope investigative, Otolaryngology-head and neck, Surgery 143 (2_suppl) (2010).