

A CSF Rhinorrhoea and Outcomes of Endoscopic Closure: A Prospective StudyShashank Sangoli¹, Sanjay M²¹Assistant Professor, Dept. of Neurosurgery, Mahadevappa Medical College, Kalaburagi²Assistant Professor, Dept. of General Medicine, Faculty of Medical Sciences (Foms)-KBNU (Khaja Banda Nawaz University)

Received: 15-10-2023 Revised: 17-11-2023 / Accepted: 21-12-2023

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Conflict of interest: Nil

Abstract

Endoscopic guided approach for surgical repair of CSF rhinorrhoea offer the benefit of both panoramic and detailed image of the site of surgery. Owing to the specific direction of view of the endoscopic lens system, it is possible to inspect the circumference of the operating field at 360 degree, by rotating the telescope around its longitudinal axis.

Keywords: Cerebrospinal fluid rhinorrhea, Nasal Cavity, Duramater

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Introduction

Cerebrospinal fluid (CSF) rhinorrhoea is the leakage of cerebrospinal fluid from the anterior cranial skull base subarachnoid space into the nasal cavity due to a defect in the duramater, bone and mucosa.

CSF rhinorrhoea involves breach of large number of anatomical structure, viz. duramater, arachnoid, the skull base, and the mucosa of the nasal cavities and the paranasal sinuses.

The main surgical approaches for the surgical repair of CSF leaks are intracranial and extracranial.

Endoscopic guided approach for surgical repair of CSF rhinorrhoea offer the benefit of both panoramic and detailed image of the site of surgery. Owing to the specific direction of view of the endoscopic lens system, it is possible to inspect the circumference of the operating field at 360 degree, by rotating the telescope around its longitudinal

axis. These technical features enables direct endonasal access to the anatomical structure at the skull base without the need for cutaneous incisions or cutting through bony segment and without dislodgement of bony structures. [1-9]

Materials and Methods

Patients with CSF rhinorrhoea originating from the paranasal sinuses and anterior skull base, from anterior and middle cranial fossa managed in Dept of Neurosurgery, Mahadevappa Medical College, Kalaburagi.

RESULTS

The following data is obtained for the present series of 21 patients with CSF rhinorrhea who failed conservative therapy and underwent endoscopic closure .

Table 1: Age wise distribution of patients

Age	No. of cases
0 to 10	2
11 to 20	4
21 to 30	5
31 to 40	2
41 to 50	5
51 to 60	2
61 to 70	1

Table 2: Sex wise distribution of patients

Sex	No.	Percent
Male	8	36
Female	22	64

Table 3: Aetiology of CSF rhinorrhoea

Aetiology	No.	Percent
Spontaneous	12	54.5
Trauma	9	41
Post meningitis	1	4.5

Table 4: Association with meningoencephalocele

Association	No.	percent
Spontaneous	5	23
Trauma	4	18
None	13	59

Table 5: Site of lesion

Site of lesion	No.	Percent
Cribriform plate	15	68.5
Anterior ethmoid	3	13.5
Posterior ethmoid	1	4.5
Frontal	2	9
Sphenoid	1	4.5

Table 6: Patients presentation

Presentation	No.	Percent
CSF leak	13	59.5
Cephalocele	1	4.5
CSF leak & cephalocele	8	36

Table 7: Type of graft used for closure

Graft	No.	percent
Middle turbinate	11	50
Temporalis fascia & middle turbinate	3	14
Fascia lata & middle turbinate	6	27
Septal cartilage & middle turbinate	2	9

Table 8: Cases that needed reclosure

	No.
No recurrence	21
Recurrence	1

Table 9: Complications encountered

Complications	No.
No complications	20
Recurrence	1
Meningitis	1

Discussion

The socio demographic data and the outcomes of the procedure were analysed and discussed. It is not our intention to compare the results of one approach with another but rather to describe our experience, in the management of CSF rhinorrhoea.

Traumatic and spontaneous cases were preferentially treated with the endoscopic closure. In

our case series the frequency of various causes of CSF rhinorrhoea are - spontaneous leaks of 12 patients, while trauma caused 9 leaks and one patient reported after meningitis. Among them 9 patients presented with meningoencephalocele along with CSF rhinorrhoea, while 13 patients presented only with the CSF rhinorrhoea.

OMMAYO et al. (1968) [10] series 80 percent of cases are secondary to head trauma, while 16

percent are the result of operations in the nasal /paranasal

cavities and skull base. Only about 4 percent of cases considered non-traumatic or spontaneous.

D.Richard Lindstrom [11] et al. experience in Wisconsin Medical college is given below in number of patients

Trauma including iatrogenic -42

Spontaneous-13

In our study the demographic data the age group affected lies between 10 to 50 years. Also in our study females are affected more compared to males, causative factor could not be identified.

D.Richard Lindstrom et al. experience in Wisconsin medical college in 53 number of patients, 28 were females and 25 were men. Patient age ranged from 21 to 72 years with mean age at repair of 47.6 years.

In our study the site of defect identified were
Cribriform plate- 68.5%

Anterior ethmoid - 13.5%

Posterior ethmoid	-	4.5%
Frontal	-	9%
Sphenoid	-	4.5%

According to Kennedy [12] site of CSF leaks among 27 patients found to be 17 patients with leak in ethmoids, while 6 patients in the cribriform plate and in the sphenoid in 4 patients.

D.Richard Lindstrom et al. experience in Wisconsin Medical college is given below in number of patients

Cribriform plate – 20 Anterior ethmoid – 10
Posterior ethmoid – 5 Frontal- 6

Sphenoid- 15

In our case series most cases are managed with locally available graft, the middle turbinate(50%). First time repair and small leaks with out meningoencephalocele usually managed with the middle turbinate. Large defect and defect with meningoencephalocele will require multi layered closure, either with septal cartilage, temporalis fascia or fascia lata. The one case that needed revision closure, was closed with the fascia lata.

In our study only one patient needed revision surgery, where the CSF leak recurred after 6 months. All other 21 patients were managed with first attempt closure (95.5 %).

Dodson et al [13] treated 29 cases of CSF rhinorrhea with endoscopic techniques. Seventy-five percent had resolution after their initial repair. Duration of follow-up ranged from 3 to 43 months. Lanza et al reviewed 36 patients that underwent endoscopic repair of CSF fistulas. During the first attempt,

successful endoscopic repair was achieved in 94%.

With Miliand Kirtane experience with 267 patients of endoscopically treated CSF rhinorrhoea , the results of achieving the closure was 96.63% in the first instance and 98.88% after revision surgery.

Most case series have reported success rates of 90 to 95 % with the endoscopic repair of CSF rhinorrhoea. D.Richard Lindstrom et al. experience in Wisconsin Medical college reported success rate of 91% with the endoscopic closure. Also in properly selected patients, non operative management was ultimately successful in 90% of patients. Because all of these therapeutic modalities can be successful, the managing surgeon must consider factors such as leak location, etiology, and closure method prior to repair. Among 22 patients only one had meningitis in the immediate post operative period, that too managed with antibiotics. Follow up of the patient for about 2years was normal and without leaks. Endoscopic closure of CSF rhinorrhoea is strongly recommended. It is safe, simple and with high success rate.

Conclusion

The present comprehensive prospective study of CSF rhinorrhoea reviews the outcomes of management and evaluate the different modes of closure which concludes with Commonest cause of CSF rhinorrhoea found to be spontaneous in nature, while trauma comes next among our patients. 11 to 50 yrs is the commonest age group affected, with about 91 percent of patients falling in this age group. Female are affected more than males in our study. Proper clinical history and investigations will identify the leaks and the site of leak and whether there is associated meningoencephalocele or not. Spontaneous csf rhinorrhoea found to be higher than traumatic, and most patients either spontaneous or traumatic presented with the meningoencephalocele. In our study the most common site of CSF rhinorrhoea found to be in cribriform plate, next being anterior ethmoid while posterior ethmoid, sphenoid and frontal areas relatively less common.

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