

## Neuro Microscopic Surgery of CSF Rhinorrhea with Fascia Lata.

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### **Abstract:**

**Introduction:** Many treatment modalities have been advocated in past and present for the treatment of Cerebro spinal Fluid (CSF) Rhinorrhea, of which neuro microscopic surgery (Endoscopy) is a promising procedure with constant excellent results worldwide. Many authors have a small series with different surgical techniques and different group of patient population, but in this series same set of patients are studied with single standard technique, showing excellent results using fascia Lata graft. With the advent of HRCT and MRI techniques the understanding of the pathoanatomy is more and the surgery can be more precise and accurate.

**Aim:** Analysis of Neuro Microscopic Surgery (Endoscopy) procedure in the outcome of CSF rhinorrhea.

**Materials and Methods:** Fifty-six patient series operated by single surgeon with standard Endoscopic operative technique using Fascia Lata graft and Fibrin Glue material and HRCT and MRI analysis by single Radiologist during 2015.

**Results:** Of this fifty-six patient series only two had post op complications, one requiring open surgery and other with residual Anosmia and the rest all had excellent functional outcome at end of 6 months follow-up.

**Conclusion:** Neuro microscopic surgery of CSF rhinorrhea using fascial lata graft with fibrin glue can be considered as Gold standard. The key for attaining constant excellent results is perfect preoperative planning in collaboration with radiology team in finding out exact defect and fistula tract leading to CSF leak. The endoscopic repair is a safe procedure and provides consistent results with minimal complications with least morbidity and scar less surgery.

**Keywords:** Endoscopy, CSF fistula, Fascia lata, Fibrin Glue.

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### I. Introduction

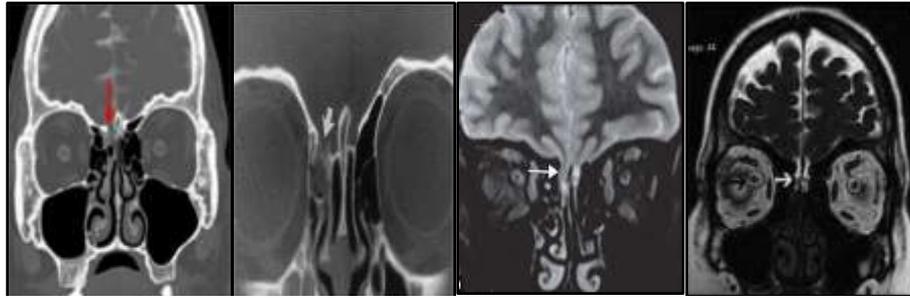
Cerebro spinal fluid (CSF) rhinorrhea is caused due to a dural tract which connects brain dura mater and nasal cavity<sup>(1-3)</sup>. This is a potential space for ascending infections and dreadful complications. The newer imaging tools in Neuro radiological sciences and Neuro microscopic surgical treatment techniques yield more accurate, promising and optimal successful treatment of CSF rhinorrhea. They have less morbidity, without facial scars and have success rates comparable to the open surgical procedures<sup>(4-6)</sup>. However, when large leaks are seen or in endoscopy failure, one has to revert to open repair.

There has been a learning curve in the procedure, but the results have remained constant with a single failure occurring in this series. Large series of CSF rhinorrhoea are still infrequent, and there is still no consensus with regards to various techniques and usage of different closure substances and artificially available materials<sup>(7-9)</sup>.

Transnasal neuro microscopy (Endoscopy) is a revolutionary treatment option. With the use of fascia lata graft, there is accurate and complete closure of the meningeal defect. We present fifty-six case series of post traumatic CSF rhinorrhea.

### II. Method

In our series, we studied fifty-six patients in the year 2015. All cases were of the age 25 years to 40 years constituting of 20 females and 36 males. All the patient group had post traumatic CSF rhinorrhea. All were subjected to 0.5 mm thin cut plain high resolution computed tomography (CT) and magnetic resonance imaging (MRI). The use of CT cisternography and T2 weighted STIR MRI images gives us clear tract of CSF fistula. Twenty-six patients had defect in Cribriform plate. Twenty patients had defect in Sphenoid plate. Ten patients had defect in Ethmoid plate.



**Fig:1.** HRCT images of CSF Rhinorrhea. **Fig:2.** MRI images of CSF Rhinorrhea.

Patients presented to us with headache and clear nasal discharge. Patients with complications such as meningitis, seizures and other comorbid conditions were excluded. Patients with associated pituitary tumors were also excluded.

Beta-2 transferrin immunoassay and Glucose levels were done in every case to confirm the rhinorrhea fluid was CSF or not. In all cases diagnostic nasal endoscopy was done. Fascia Lata graft placement was done in the intracranial space and ciribriform plate. Endoscopic fistula excision was done in all cases.

All the patients were counselled in detailed about the procedure. All patients underwent standard preoperative surgical protocol tests and pre anaesthetic checkup. Surgery consent and case study consent was taken.

Diagnostic endoscopy was made with 4mm rigid endoscope. After the site of leak was identified, it was prepared with burr and cautery. Fascia lata graft and fat layer was placed in the defect and graft adhered with fibrin glue and gelatin material to close the defect and nasal pack was applied. Tension free closure was done in all cases to avoid inflammatory sequelae. Patient were sent home 5 days after surgery.

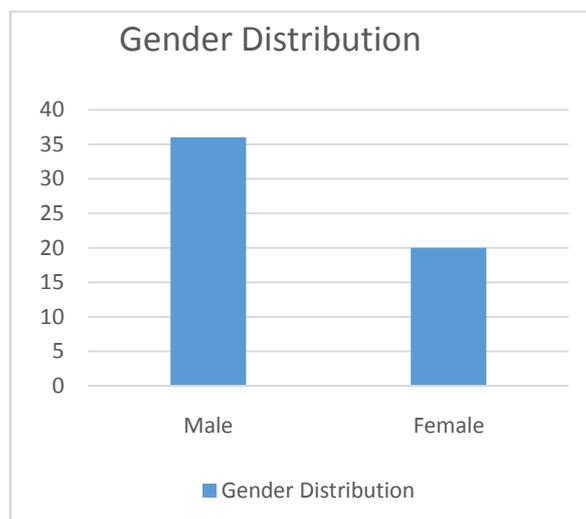
In all cases CT and MRI films correlated to site of leak in endoscopy findings. Standard post-operative care protocol and antibiotics were given for 2 weeks. patients for follow-up at 2weeks, 6 weeks, 3months and 6 months. The final outcome of the study was measured by absence of CSF leak at end of 6-month post operation.

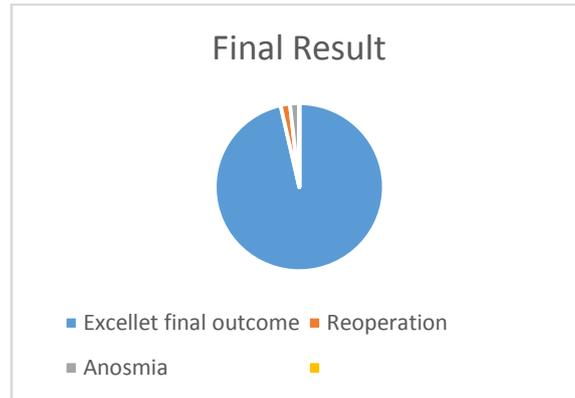
Name	Site of CSF leak	2weeks follow up
Age / Gender	CT findings	6 weeks follow up
IP Number	MRI findings	3 months follow up
Address	Tests	6 months follow up
Contact	Endoscopy findings	

**Table:** Follow up Protocol chart.

### III. Results

All fifty-six patients were evaluated in the total study period in 2015. There were no drop outs for follow up. The average follow up was 10 months ranging from 6 months to 12 months. All cases were of the age 25 years to 40 years constituting of 20 females and 36 males. All the patient group had post traumatic CSF rhinorrhea. None of the patient developed post-operative meningitis or seizures.SPSS window version 19.0 was used for data analyses. Level of significance was considered at P value below 0.05.





In this case series only one patient developed post-operative recurrence of leak, which required two endoscopies later on with debridement surgery and landed up in open craniotomy procedure. One patient had persistent anosmia. Rest all patients had no leak and symptoms subsided with six months of follow up. We have excellent results in this series.

#### **IV. Discussion**

Neuro microscopic surgery of CSF rhinorrhea can be considered as Gold standard. With collaboration of Radiologist and Neurosurgeon team, the diagnosis and treatment of CSF rhinorrhea has reached to accuracy in recent years<sup>(1-3)</sup>.

The most common cause in our series was post traumatic CSF leak, when compared to other series by Saafan ME etal<sup>(4-5)</sup> was non traumatic and congenital CSF leaks in with results were excellent. Men were more affected than women in our series when compared to other series by Castelnuovo Petal<sup>(5-7)</sup>. The site of leak in our series was seen more in the cribriform plate (46 %) as compared to other series by Zweig JL<sup>(7-9)</sup> in which ethmoid plate leak was more and results shown were average and required revision of primary procedure to open craniotomy surgeries. The diagnosis of CSF fluid done by beta 2 immunoassy and glucose levels was done in our series which is comparable to other series<sup>(10-14)</sup> as gold standard for CSF.

CT and MRI images and correlation was 100% in our series as compared to other series which showed only 86% and 79% in few other studies<sup>(15-17)</sup> direct endoscopy was performed. Usage of Fascia lata graft to close the defect in this series is also comparable in other series<sup>(18-19)</sup> with variable results. Usage of fibrin glue gelatin material in this series gave higher and constant results when compared to other series<sup>(20-21)</sup> which showed suturing of graft and leaving graft just in place did not yield good results and high rate of failures in other series.

This series show 97% success rate following Neuro microscopic surgery of CSF rhinorrhea using fascia lata graft as compared to Schlosser RJ, Schoentgen C, Chaaban MR. only one patient required open revision procedure. Similar studies worldwide have shown a high rate of success following an endoscopic repair of more than 90% and are today considered the standard of surgical care for CSF rhinorrhoea.

#### **V. Conclusion**

Neuro microscopic surgery of CSF rhinorrhea using fascial lata graft with fibrin glue can be considered as Gold standard. The key for attaining constant excellent results is perfect preoperative planning in collaboration with radiology team in finding out exact defect and fistula tract leading to CSF leak. Perfect preparation of graft bed and stable fixation of graft plays an important role in attaining excellent results. Optimal measures should be taken not to raise Intra cranial pressure perioperative period. The endoscopic repair is a safe procedure and provides consistent results with minimal complications.

#### **Acknowledgements**

The authors have no financial benefits or interests from anybody else in the subject matter of this article.

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