

Original Article

Role of Functional Endoscopic Sinus Surgery (FESS) in Patients with Sinonasal Disease with and Without Jala Neti (Saline Irrigation): A Comparative Study

Dr Ruchika Jhajharia¹, Dr Yashasvi Saini², Dr. Pratibha Krishniya³, Dr. Rakesh Saboo⁴

¹Assistant Professor, Department of ENT, Government Medical College, Jhunjhunu

²Senior Resident, Department of ENT, Government Medical College, Jhunjhunu

³Junior specialist, Department of ENT, Government Medical college, jhunjhunu

⁴Professor and Head of the Department, Department of ENT, Government Medical College, Jhunjhunu

OPEN ACCESS**ABSTRACT****Corresponding Author:****Dr Ruchika Jhajharia**

Assistant Professor, Department of ENT, Government Medical College, Jhunjhunu

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Background: Chronic sinusal diseases significantly impair quality of life and often require surgical intervention when medical therapy fails. Functional Endoscopic Sinus Surgery (FESS) is the standard surgical treatment. Postoperative saline irrigation, including traditional practices such as *Jala Neti*, is believed to enhance mucociliary clearance and surgical outcomes.

Objective: To evaluate and compare the clinical outcomes of patients undergoing FESS with postoperative *Jala Neti* (saline irrigation) versus those without saline irrigation.

Methods: This prospective comparative study was conducted in a tertiary care center. Patients with chronic rhinosinusitis refractory to medical management were divided into two groups: Group A (FESS with postoperative *Jala Neti*) and Group B (FESS without saline irrigation). Outcomes were assessed using symptom scores, endoscopic findings, and complication rates over a 6-month follow-up period.

Results: Patients in Group A showed significantly greater improvement in symptom scores, faster mucosal healing, reduced crusting, and lower postoperative infection rates compared to Group B. Endoscopic evaluation revealed better patency of sinus ostia and healthier mucosa in the *Jala Neti* group.

Conclusion: Postoperative *Jala Neti* following FESS significantly improves surgical outcomes, accelerates healing, and reduces complications. Incorporation of saline irrigation as an adjunct to FESS is recommended for optimal management of sinusal diseases.

Keywords: FESS, Chronic rhinosinusitis, *Jala Neti*, Saline irrigation, Sinusal disease.

INTRODUCTION

Sinusal diseases, particularly chronic rhinosinusitis (CRS), represent a common and debilitating condition affecting a significant proportion of the population worldwide. CRS is characterized by persistent inflammation of the nasal and paranasal sinus mucosa lasting more than 12 weeks despite optimal medical therapy.¹⁻³

Functional Endoscopic Sinus Surgery (FESS), introduced by Messerklinger and popularized by Stammberger, has revolutionized the management of CRS by restoring physiological sinus ventilation and drainage while preserving normal mucosa.^{4,5}

Postoperative care plays a crucial role in determining the success of FESS. Saline nasal irrigation has been widely advocated to remove crusts, allergens, inflammatory mediators, and secretions, thereby improving mucociliary clearance. *Jala Neti*, a traditional yogic practice, involves nasal saline irrigation and has been practiced for centuries for nasal hygiene and sinus health.⁶

Despite its widespread traditional use, scientific evidence comparing outcomes of FESS with and without Jala Neti remains limited. This study aims to evaluate the role of postoperative Jala Neti in enhancing clinical outcomes following FESS.

OBJECTIVES

1. To assess the clinical outcomes of FESS in patients with sinonal disease
2. To compare postoperative symptom relief between patients practicing Jala Neti and those who do not
3. To evaluate endoscopic healing and complication rates in both groups

MATERIALS AND METHODS

The Present Prospective comparative study was conducted among 60 Patients diagnosed with chronic sinonal disease requiring FESS at Department of Otorhinolaryngology, Tertiary Care Teaching Hospital, Sikar Rajasthan. Study duration was 18 month. 60 patients were equally divided in to two groups. Group A 30 patients underwent FESS with postoperative Jala Neti and group B 30 patients underwent FESS without saline irrigation. Patients were followed at 1 week, 1 month, 3 months, 6 months.

Inclusion Criteria

- Age 18–60 years
- Diagnosed cases of chronic rhinosinusitis (with or without nasal polyps)
- Failure of at least 12 weeks of optimal medical management
- Willingness to provide informed consent

Exclusion Criteria

- Acute sinus infections
- Fungal sinusitis
- Sinonal malignancy
- Previous sinonal surgery
- Immunocompromised patients

Preoperative Evaluation

- Detailed history and clinical examination
- Diagnostic nasal endoscopy
- CT scan of paranasal sinuses (Lund-Mackay scoring)
- Symptom assessment using Visual Analog Scale (VAS)

Surgical Procedure

All patients underwent standardized Functional Endoscopic Sinus Surgery under general anesthesia. Procedures included uncinatectomy, middle meatal antrostomy, anterior and posterior ethmoidectomy as indicated.

Postoperative Protocol

Group A (FESS + Jala Neti)

- Initiated Jala Neti using isotonic saline from postoperative day 7
- Once daily for first month, then alternate days for 3 months
- Technique taught under supervision

Group B (FESS only)

- Standard postoperative care without saline irrigation

Both groups received identical antibiotic and steroid regimens.

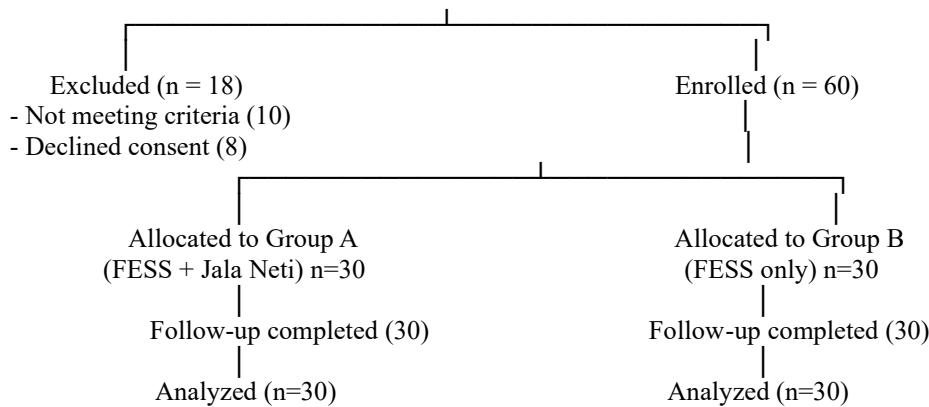
Outcome Parameters:

- Symptom score improvement (VAS)
- Endoscopic findings (mucosal edema, crusting, discharge, synechiae)
- Complication rates

CONSORT FLOW DIAGRAM: CONSORT flow diagram depicting patient recruitment, allocation, follow-up, and analysis.

(For Randomized/Comparative Study Presentation)

Assessed for eligibility (n = 78)



Statistical Analysis

Data were analyzed using SPSS software (Version 26.0). Continuous variables were compared using Student's *t*-test and categorical variables using Chi-square test. *p* < 0.05 was considered statistically significant.

RESULT

The Present Prospective comparative study was conducted among 60 Patients diagnosed with chronic sinonasal disease requiring FESS. Both groups were comparable with respect to age, gender, and disease pattern, indicating good randomization. (Table 1) There was no statistically significant difference in baseline symptom severity between the groups. (Table 2) Patients practicing Jala Neti showed significantly superior symptom relief at 6 months. (Table 3) There was statistically significant difference found in Endoscopic Findings (Healthy mucosa, Crusting, Edema) after 3 month. (Table 4) Adjunctive Jala Neti reduced postoperative morbidity and need for revision procedures. (Table 5) There was statistically significant reduction found in postoperative mean VAS score among group A as compare to group B. (Figure 1)

Table 1: Demographic Characteristics of Study Population

Parameter	Group A (FESS + Jala Neti) n=30	Group B (FESS only) n=30	<i>p</i> value
Mean Age (years)	37.8 ± 9.6	39.1 ± 10.8	0.62(NS)
Gender (M/F)	17 / 13	16 / 14	0.79(NS)
CRS with polyps	12 (40%)	11 (36.7%)	0.79(NS)
CRS without polyps	18 (60%)	19 (63.3%)	0.79(NS)

Table 2: Preoperative Mean Symptom Scores (VAS)

Symptom	Group A	Group B	<i>p</i> value
Nasal obstruction	8.2 ± 0.9	8.1 ± 1.0	0.73(NS)
Nasal discharge	7.6 ± 1.1	7.4 ± 1.2	0.64(NS)
Facial pain	6.9 ± 1.3	7.1 ± 1.4	0.58(NS)
Headache	6.4 ± 1.5	6.6 ± 1.4	0.61(NS)

Table 3: Postoperative Symptom Scores at 6 Months

Symptom	Group A	Group B	<i>p</i> value
Nasal obstruction	1.9 ± 0.8	3.4 ± 1.1	0.001(HS)
Nasal discharge	1.7 ± 0.6	3.1 ± 0.9	0.002(HS)
Facial pain	1.3 ± 0.5	2.6 ± 0.8	0.001(HS)
Headache	1.2 ± 0.4	2.4 ± 0.7	0.003(HS)

Table 4: Endoscopic Findings at 3 Months

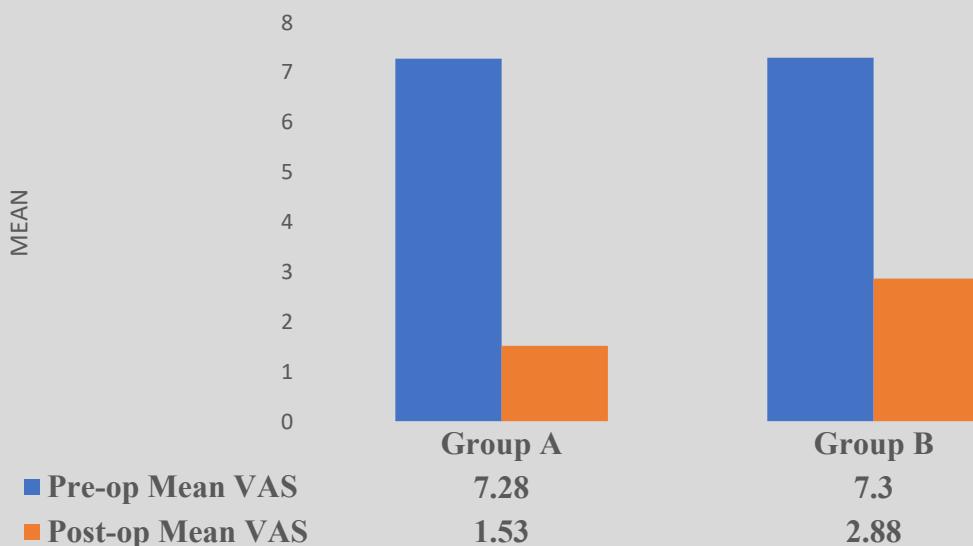
Endoscopic Parameter	Group A n (%)	Group B n (%)	<i>p</i> value
Healthy mucosa	26 (86.7%)	18 (60%)	0.02(S)
Crusting	4 (13.3%)	14 (46.7%)	0.006(S)
Edema	5 (16.7%)	13 (43.3%)	0.03(S)
Synechiae	1 (3.3%)	5 (16.7%)	0.05(S)

Table 5: Postoperative Complications

Complication	Group A	Group B
Excessive crusting	4	14
Synechiae formation	1	5

Post-op infection	1	4
Revision surgery	0	2

Figure 1: Comparison of Mean VAS Score Reduction at 6 Months



DISCUSSION

FESS is the gold standard surgical treatment for chronic sinonasal disease; however, its success heavily depends on effective postoperative care. The present study demonstrates that adjunctive postoperative Jala Neti significantly enhances clinical outcomes.

The immediate post operative period in endoscopic sinus surgery is marked by widespread mucosal edema, collection of clots and debris inside the nasal cavity.^{7,8} This is due to altered mucocilliary function of the nasal and paranasal sinus mucosa as a result of surgery, instrumentation and nasal packing. Thus the post operative patients are advised to do nasal douching after nasal pack removal to reduce the morbidity.⁹

Nasal douching helps to improve the mucocilliary function reduces mucosal edema and remove infected debris and clots from nasal cavity. Different solutions like normal saline, lactate ringer's solution, budesonide solution, and different concentration of hypertonic saline have been tried in the past for nasal irrigation in post operative endoscopic sinus surgery patients. Many studies have been done in the past comparing the efficacy of these different irrigating solutions with varying results.^{10,11}

Saline irrigation improves mucociliary clearance, reduces inflammatory mediators, and prevents crust formation. Traditional Jala Neti, when practiced correctly with isotonic saline, is safe and cost-effective.

Our findings are consistent with previous studies¹²⁻¹⁵ that have demonstrated improved postoperative healing and symptom relief with saline irrigation. The reduced incidence of synechiae and infection in Group A further supports the role of nasal irrigation in postoperative care.

Kumar Jet al⁸ found out that hypertonic saline nasal irrigation was more effective than isotonic saline nasal irrigation in post operative endoscopic sinus surgery patients, while Keojampa et al¹⁶ found no difference in efficacy of hypertonic and isotonic saline when used for nasal irrigation in post FESS patients.

Similar studies done by Hauptman et al found that use of buffered isotonic saline helped in relieving nasal obstruction better than hypertonic saline in the post operative period.¹⁷ Similar observations were made in study done by salib et al, who reported that use of high volume low pressure saline irrigations have a better effect than low volume high pressure saline irrigation.¹⁸

Limitations

- Relatively small sample size
- Short-term follow-up
- Subjective symptom assessment

Further multicentric studies with larger populations are recommended.

CONCLUSION

Postoperative Jala Neti significantly improves the outcomes of Functional Endoscopic Sinus Surgery by enhancing symptom relief, promoting faster mucosal healing, and reducing complications. Incorporation of saline irrigation as a routine postoperative adjunct to FESS is strongly recommended in patients with sinonasal disease.

Clinical Implications

- Improves patient compliance and satisfaction
- Cost-effective and easily teachable
- Reduces need for prolonged medication

REFERENCES

1. Stammberger H. Functional endoscopic sinus surgery. *Laryngoscope*. 1985;95:1-13.
2. Kennedy DW. Functional endoscopic sinus surgery. *Arch Otolaryngol*. 1985;111:643-649.
3. Harvey R, Hannan SA, Badia L, Scadding G. Nasal saline irrigations for CRS. *Cochrane Database Syst Rev*. 2007;3:CD006394.
4. Tomooka LT, Murphy C, Davidson TM. Clinical study of nasal irrigation. *Laryngoscope*. 2000;110:1189-1193.
5. Hauptman G, Ryan MW. The effect of saline irrigation on sinonasal symptoms. *Otolaryngol Head Neck Surg*. 2007;137:815-819.
6. Brown CL, Graham SM. Nasal irrigations: good or bad? *Curr Opin Otolaryngol*. 2004;12:9-13.
7. Fernandes SV. Postoperative care in functional endoscopic sinus surgery. *Laryngoscope*. 1999;(6):945-8.
8. Kumar J, PadiyarBV, Priya M, Arun K. The Effect of Hypertonic Saline Versus Isotonic Saline Irrigation Following Endoscopic Sinus Surgery-A Comparative Study. *Glob J Oto*. 2018;(5):555-8.
9. Boek WM, Keles N, Graamans K. Physiologic and hypertonic saline solutions impair ciliary activity in vitro. *Laryngoscope*. 1999;(3):396-9.
10. Sisandi KN P, Buana AW, Taruna D, Pasaribu IA. The effectiveness of nasal irrigation with physiological saline solution in chronic rhinosinusitis patients after endoscopic sinus surgery at RSPAL Dr. Ramelan Surabaya (2021–2024). *E-Jurnal Medika Udayana*. 2025;14(11).
11. Tsuzuki K, [others]. Predictors of the need for additional postoperative treatment for eosinophilic chronic rhinosinusitis. *ORL*. 2025;87(1):1–10. [Karger Publishers](#)
12. Areena Anjum, Majeed F, Mir SA, Kalsotra P, Showket Z. Efficacy of nasal irrigation of normal saline as compared to budesonide following functional endoscopic sinus surgery. *Int J Res Med Sci*. 2023; (Volume/Issue). [msjonline.org](#)
13. Khan S, Khan AU, Khan MN, Rasheed MT, Nadeem M, Chaudhry K. Efficacy of functional endoscopic sinus surgery (FESS) for the treatment of chronic rhinosinusitis. *Int J Health Sci*. 2023;6(S10):1500–1506. [sciencescholar.us](#)
14. Sisandi KNP, Buana AW, Taruna D, Pasaribu IA. The effectiveness of nasal irrigation with physiological saline solution in chronic rhinosinusitis patients after endoscopic sinus surgery at RSPAL Dr. Ramelan Surabaya (2021–2024). *E-Jurnal Medika Udayana*. 2025;14(11):[Article no].
15. Anjum A, Majeed F, Mir SA, Kalsotra P, Showket Z. Efficacy of nasal irrigation of normal saline as compared to budesonide following functional endoscopic sinus surgery. *Int J Res Med Sci*. 2023.
16. Keojampa KB, Nguyen MH, Ryan MW. Effects of buffered saline solution on nasal mucociliary clearance and nasal airway patency. *Otolaryngol Head Neck Surg*. 2004;(5):679-82.
17. Hauptman G, Ryan MW. The effect of saline solutions on nasal patency and mucociliary clearance in rhinosinusitis patients. *Otolaryngol Head Neck Surg*. 2007;(5):815-21.
18. SalibRJ, Talpallikar S, Uppal S, Nair SB. A prospective ran-domised single-blinded clinical trial comparing the efficacy and tolerability of the nasal douching products Sterimar TM and Sinus Rinse TM following functional endoscopic sinus surgery. *Clin Otolaryngol*. 2013;(4):297-305