Original Article

Utilising A Silastic Sheet In Endoscopic Sinus Surgery To Prevent The Formation Of Lateral Synechiae

Muhammad Ali[1], Nighat Arif[2], Farhat Jabeen Malik[3]

Abstract

Objective: To compare the formation of lateral nasal synechiae after endoscopic sinus surgery with and without insertion of a silastic sheet between the middle turbinate and lateral nasal wall.

Methods: This study includes 70 patients of either gender, 20-60 years of age, admitted for elective endoscopic sinus surgery for chronic rhinosinusitis. Patients were divided into two groups. In group S, a silicone sheet was placed between the middle turbinate and the lateral nasal wall. While in group-T, no silicone sheet was placed. All patients were evaluated for the development of lateral nasal synechiae up to the 6th post-operative month.

Results: In group-S, 3 (8.6%) patients developed lateral nasal synechiae, while in group-T, 11 (31.4%) patients developed lateral nasal synechiae. Comparison of both groups showed a p-value of 0.017.

Conclusion: Silastic sheet placement in the middle meatus significantly reduces the formation of lateral nasal synechiae after endoscopic sinus surgery.

Keywords: Rhinosinusitis, middle meatus, Nasal Surgery, Endoscopic sinus surgery, nasal synechia

Contributions:
MA - Conception, Design
NA, FJM - Acquisition, Analysis, Interpretation
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Introduction

Chronic Rhinosinusitis (CRS) is characterised by persistent inflammation of the mucous membranes in the nasal and paranasal sinuses lasting for more than 12 weeks. Approximately 13% of the population is affected by this condition, significantly impacting the quality of life for those affected. When medicinal interventions fail to bring about improvement, Endoscopic Sinus Surgery (ESS) is considered the most effective surgical option for eligible patients.[1, 2]
Endoscopic Sinus Surgery (ESS) is a widely performed surgical procedure worldwide. This is primarily attributed to its ability to preserve the sinus mucosa, facilitate natural sinus ventilation and drainage through the natural openings, and effectively eliminate the underlying disease. This therapeutic approach is advised for individuals experiencing persistent chronic sinusitis or its complications, mucoceles, nasal polyps, fungal infections, or neoplasms.[3] Endoscopic Sinus Surgery (ESS), even when conducted by a skilled surgeon, is not without its complications. The incidence of complications is directly linked to the scope of the operation, the presence and severity of polyps, and whether it is performed as a revision surgery.[4]
Intranasal adhesions, also known as synechiae, occur due to inadequate repair of the lining of the nose. Synechiae development is the prevailing complication that occurs most often after ESS. Adhesions in the middle meatus might obstruct the usual flow of mucus and cilia in the sinuses, resulting in the reappearance of the condition. The prevalence of this complication in rhino-surgical operations varies from 6.8% to 36.2%.[5] Scientists have been investigating the problem of intranasal adhesions that arise following nasal cavity surgeries since 1987. However, thorough research is still needed.[6]

Various methods, such as suture medialization, partial removal of the middle turbinate, and nasal packing in the middle meatus, were utilised to avoid the development of postoperative synechia. The use of nasal packing remains the prevailing method employed to avert this problem. The efficacy of conventional packing goods, including both absorbable and non-absorbable options, has been assessed in terms of their ability to prevent middle meatal adhesions. Scientists have been studying the problem of intranasal adhesions that arise following nasal cavity surgeries since 1987. However, a comprehensive investigation is still needed.[7] Despite several attempts to avoid the development of lateral synechia following ESS, each approach has its drawbacks or challenges, and there is currently no universally accepted solution. Research was conducted to determine the efficacy of using a Silastic sheet to prevent the development of synechia. The success rate of our strategy was found to be 90.3%.[8] This study evaluated the efficacy of inserting a Silastic sheet between the middle turbinate and lateral nasal wall to prevent the formation of lateral synechia.

Materials And Methods

This cross-sectional study was conducted at the Railway Hospital Rawalpindi from July to December 2023. By using the WHO sample size calculator, a sample of 70 is calculated at a 95% confidence level, 10% margin of error and taking the success rate of the silastic sheet as 90.3%[8]. Patients of either gender, 20-60 years of age, with persistent chronic rhinosinusitis planned for endoscopic sinus surgery were included in this study. Patients having a previous history of endoscopic sinus surgery or intranasal polypectomy were excluded. Ethical review was sought before conducting the study. Informed consent was taken from all patients. Patients were sorted into two groups using a lottery method. All patients were operated on by a single blindfolded senior ENT surgeon in general anaesthesia. Standard endoscopic sinus surgery was done in all patients. Nasal packing was kept for 24 hours. In Group-S patients, a 0.03-inch-thick flexible silicone sheet was placed between the middle turbinate and the lateral nasal wall by the technique described by Lee et al.[8]. In Group-T patients, no silicone sheet was placed. Post-operatively, all patients used oral antibiotics, oral prednisolone, intra-nasal steroid spray and nasal saline irrigation for 21 days. The Silastic sheet of group-S patients was removed on the 21st post-operative day. All patients were evaluated for the development of middle meatal synechiae once a month up to 6th months post-operatively. Data was analysed using SPSS 21. Mean and standard deviation were determined for quantitative variables. Qualitative factors were analysed using frequency and percentage. Chi-square was used to determine the effectiveness of both groups. A p-value of <0.05 was considered statistically significant.

Results

This study included 28 (40%) males and 42(60%) females. The age range was 20-60 years. The mean age in group S and group T was 40.17 ± 10.92 and 41.29 ± 10.21, respectively. Table1.

Table 1: Age and gender distribution for groups (n=70)

		Group S (n=35)	Group T (n=35)
Gender	**Male**	15(62.1%)	13 (67.5 %)
	Female	20 (37.9%)	22 (32.5 %)
Age in years	**Mean ± SD**	40.17 ± 10.92	41.29 ± 10.21

In group S, 3 (8.6%) patients developed lateral nasal synechiae. In group T 11(31.4%), patients developed lateral nasal synechiae. Comparison of both groups showed a p-value of 0.017, which is statistically significant. Table 2

Table 2: Comparison of both groups in terms of lateral nasal synechiae formation (n=70)

	Lateral nasal synechiae formation after endoscopic sinus surgery		
	YES	**NO**	
Group S (n=35)	3 (8.6 %)	32 (91.6%)	**p-value= 0.017**
Group T (n=35)	11 (31.4%)	24 (68.6%)	

Discussion

ESS is now the preferred approach for managing CRC and nasal polyps that do not respond to conventional treatment. The prevailing complication is the development of postoperative synechiae, with an incidence ranging from 1% to 36%.[9] Intranasal synechiae production is facilitated by the presence of retained secretions, mucosal injury, scar formation, and severe nasal crusting. Adhesions hinder the regular movement of mucus in the sinuses, leading to a recurrence. Various surgical techniques, such as partially removing the middle turbinate and using biodegradable packing materials placed within the nose, have been effective in reducing the occurrence of postoperative synechiae development.[10,11]

Numerous techniques have been put out to address the unstable middle turbinate and avoid synechiae. Friedman et al. Suggested middle turbinate medialization by using microdebrider-assisted mucosal abrasion to induce a controlled synechia between the caudal end of the middle turbinate and the septum.[12] The rate of Synechiae formation was 14 (20.0%), which is similar to other studies.[11] Various studies have found varying rates of Synechiae development. Khammas AH et al. observed that 45% of patients who received FESS without fixing the middle turbinate experienced synechia, but none of the patients who had their middle turbinate fixed via either bolgerization or conchopexy developed synechia.[13] Mohammad et al. observed a prevalence of synechia in 38% of individuals lacking middle turbinate fixation, compared to 7% in patients with middle turbinate fixation.[14] Dutton and Hinton found that the lateralisation of the middle turbinate may be avoided in 88% of instances by the use of bolgerization, and in 90% of cases through the implementation of Conchopexy.[15]

The findings of our research indicated a notable disparity in the occurrence of Synechiae development. In group A, only 3 patients (8.6%) had synechiae, but in the other group, 11 patients (31.4%) acquired synechiae. Treatment success rate in group A was 91.4% while in group B it was 68.6%. A study reported the success rate of 94% with the use of Silastic sheet[8]. Research conducted by Odat et al,[16] discovered that use of a middle meatal silastic splint resulted in a considerable reduction in the formation of

adhesions between the middle turbinate and the lateral nasal wall. Adhesions were seen on 10% of the splinted sides (5 out of 50) and in 26% of the non-splinted sides (13 out of 50) one month following the surgery. The difference in synechia occurrence in the two groups was statistically significant (P = 0.037). Baguley et al,[17] examined the effectiveness of Silastic splints in avoiding synechia after ESS for CRS. Synechia was detected in 32% of the non-splinted side compared to 8% of the splinted side.

Conclusions

Findings of this research indicate that placement of a silicone sheet in the middle meatus is an effective technique for avoiding the development of lateral synechia.

Author Information

1,3. Assistant Professor, ENT, IIMC 2. Professor, ENT, IIMC.
Corresponding author: Dr. Muhammad Ali alisaleem933@gmail.com.

References

1. Fokkens WJ, Lund VJ, Hopkins C, Hellings PW, Kern R, Reitsma S, et al. European position paper on rhinosinusitis and nasal polyps 2020. Rhinology. 2020;58(Suppl S29):1-464. https://doi.org/10.4193/Rhin20.600.
2. Benjamin MR, Stevens WW, Li N, Bose S, Grammer LC, Kern RC, et al. Clinical characteristics of patients with chronic rhinosinusitis without nasal polyps in an academic setting. J Allergy Clin Immunol Pract. 2019;7(3):1010-1016. https://doi.org/10.1016/j.jaip.2018.10.014.
3. Korkmaz H, Korkmaz M. Endoscopic sinus surgery- surgical steps with Implications in Intraoperative complications. Mid Blac Sea J Health Sci. 2022;8(2):320-331. https://doi.org/10.19127/mbsjohs.1071048.
4. Lourijsen ES, Reitsma S, Vleming M, Hannink G, Adriaensen GFJPM, Cornet ME, et al. Endoscopic sinus surgery with medical therapy versus medical therapy for chronic rhinosinusitis with nasal polyps: a multicentre, randomised, controlled trial. Lancet Respir Med. 2022;10(4):337-346. https://doi.org/10.1016/S2213-2600(21)00457-4.
5. Kim TK, Jeong JY. Deviated nose: Physiological and pathological changes of the nasal cavity. Arch Plast Surg. 2020;47(6):505-515. doi:10.5999/aps.2020.01781.
6. Stępiński MJ, Banaszewski J. Intranasal synechiae as complications of rhinosurgical treatment-A review of current knowledge. J Clin Med. 2023;12(21):6831. https://doi.org/10.3390/jcm12216831.
7. Hasan DS, Ali MK, Fadhil AS, Taha MR. Prevention of Middle Meatal Synechia Formation after Endoscopic Sinus Surgery with Different Packing Materials. Iraqi Medical Journal. 2019;65(2):161-166.
8. Alaryani RA, Alhedaithy RA. Preventive Measures of Middle Turbinate Lateralization After Endoscopic Sinus Surgery: An Updated Review. Cureus. 2021;13(6):e15763. https://doi.org/10.7759/cureus.15763.
9. Tang DM, Roxbury CR. Management of the middle turbinate during and after sinus surgery. Curr Opin Otolaryngol Head Neck Surg. 2022 ;30(1):40-45. https://doi.org/10.1097/MOO.0000000000000777.
10. Khatri H, Salati H, Wong E, Bradshaw K, Inthavong K, Sacks R, et al. Modelling the effects of post-FESS middle turbinate synechiae on sinonasal physiology: A computational fluid dynamics study. Auris Nasus Larynx. 2023;50(6):911-920. https://doi.org/10.1016/j.anl.2023.04.003.
11. Arsalan D, Hassan Syed S, Murtaza G, Qamar Nasir M, Awais Amin M, Ayub Awan A. The frequency of intranasal synechiae formation between nasal septum and lateral nasal wall after endoscopic sinus surgery among patients with sinonasal polyposis. Esculapio - JSIMS . 2023;16(3):70-74. https://doi.org/10.51273/esc20.2516315.
12. Anchan SV, Shah V, Jalisatgi RR, Naik AS, Sidappa R, Pandurangi AS. A Comparative Study of Interventions of Middle Turbinate Medialization in Endoscopic Sinus Surgery. Indian J Otolaryngol Head Neck Surg. 2022;74(Suppl 2):1706-1712. https://doi.org/10.1007/s12070-021-02861-w.
13. Khafagy Y, Ghonim M, Elzayat S, Elgendy A. Comparison between the endoscopic scores of bolgerization versus partial resection of the middle turbinate for management of the postoperative lateralization in the early follow-up period after endoscopic frontal sinusotomy: A randomized controlled study. Am J Otolaryngol. 2021;42(5):102998. https://doi.org/10.1016/j.amjoto.2021.102998.
14. Abdelhamid HI, Awad AMM, Albadea AMA, Khaled IA, El-Anwar MW, El-Ahl MAS. A novel technique with butterfly splint for middle turbinate stabilization in sinus surgery. Eur Arch Otorhinolaryngol. 2024;281(3):1325-1330. https://doi.org/10.1007/s00405-023-08322-0.
15. Odat H, Al-Qudah M, Al-Gargaz W. Wedge-shape Merocel Pack After Functional Endoscopic Sinus Surgery: Our Experience With 697 Patients. Med Arch. 2021;75(3):229-233. https://doi.org/10.5455/medarh.2021.75.229-233.
16. Odat H, Al-Qudah M, Alzoubi F, Bani-Ata M, Hamouri S, Al-Alawneh M, et al. Assessing effects of modification of middle meatal silastic splint after endoscopic sinus surgery for nasal polyps: A randomized controlled study. Ann Med Surg (Lond). 2020;58:172-176. https://doi.org/10.1016/j.amsu.2020.08.047.
17. Zamaili AM, Kueh YC, Mohamad S, Abdullah B. The impact of middle meatal steroid-eluting implants on the postoperative outcomes of chronic rhinosinusitis: A systematic review and meta-analysis. Eur Ann Otorhinolaryngol Head Neck Dis. 2025;142(1):26-37. https://doi.org/10.1016/j.anorl.2024.02.014