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EFFICACY OF SEPTOPLASTY VERSUS MEDICAL MANAGEMENT FOR NASAL OBSTRUCTION IN, MODERATE NASAL SEPTAL DEVIATION

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Abstract

Introduction: *Nasal obstruction/ blockage is a common ailment that significantly lowers the quality of life. One of the main cause for symptoms like congestion, headaches, and postnasal dripping is due to a deviated nasal septum (DNS), which can also impede airflow and cause above mentioned symptoms. A cautious medication care with intranasal corticosteroids and decongestants, and surgical rectification with septoplasty are the two main management modalities. For mild septal abnormalities, there is ongoing discussion on the best course of action. In this study, to compare the efficacy of septoplasty against medical therapy in patients with moderate septal deviation, patient outcome based on NOSE score and symptoms relief are studied.*

Objective: *The objective of this study is to compare the results of medical therapy and septoplasty in reducing nasal obstruction brought on by moderate deviated nasal septum (DNS) and to analysis which of the type of treatment is more effective. Using symptom remission Nasal Obstruction Symptom Evaluation (NOSE) scores over a follow up period of six Months (06 x months) to assess the patient outcome. The study also aims to carryout comparison between global viewpoints on DNS management and highlight the cultural, economic, and social elements that effect treatment choices, especially in Pakistan.*

Methods: *This study was carried out in PNS Shifa Hospital in Karachi, Pakistan. In this study, pre and post operation/ medical treatment data of 80 x patients ranging in age from 18 to 68 were analyze. The two treatment approaches used to categorize the participants i.e surgical septoplasty (group) and medicinal management (conservative group). To record the severity of symptoms, the Nasal Obstruction Symptom Evaluation (NOSE) score was used and Cottle's classification was used to determine the severity of DNS and Cottles II (Mild DNS) patients were segregated and further results of patients with mild DNS (30 x Patients) was manage through medical (15 x patients) and surgical septoplasty (15 x Patients). At baseline and six months after therapy, follow-ups were carried*

out. To compare the outcome of medical and surgical efficacy statistical data on patient record forms were noted and compared by using statistical methods like paired t-tests and chi-square.

Results: *Patients who underwent septoplasty demonstrated significant improvements in nasal obstruction, with NOSE scores decreasing from a mean of 38.6 (pre-treatment) to 9.7 (post-treatment). The medical management group exhibited limited improvements, with post-treatment NOSE scores remaining elevated at 15-30. Patients in surgical group reported significant improvement rate. The most common symptoms addressed were nasal obstruction (100% of cases), headache (47%), and postnasal dripping (37%). In medical group, only 33% of patients achieved significant improvement, while 67% had persistent symptoms (e.g., nasal obstruction, headaches).Headaches persisted in 50% of medical group patients who initially reported them, suggesting multifactorial etiology beyond nasal obstruction. Statistical analysis confirmed that septoplasty provided superior long-term relief ($p<0.001$).*

Conclusion: *Septoplasty is more effective than medical management in alleviating nasal obstruction caused by moderate DNS. While medical therapy may offer short-term relief, it does not provide substantial long-term improvements. Patients with persistent symptoms, should be prioritized for surgical intervention instead of medical management.*

INTRODUCTION

Nasal obstruction is one of the most common complaints encountered in otolaryngology clinics worldwide, affecting millions of individuals and significantly impacting their quality of life. It is estimated that 20-30% of the global population suffers from chronic nasal obstruction, with a deviated nasal septum (DNS) being one of the leading structural causes [1]. Becker (2004) provides a comprehensive overview of rhinoplasty's development, highlighting that SMR was among the earliest surgical techniques aimed at correcting nasal obstruction by removing the deviated cartilage and bone beneath the mucosa. Although septoplasty marked a significant advancement by preserving the nasal mucosa and reducing external deformities, its limitations included the potential for postoperative complications such as septal perforation and excessive tissue removal. These historical insights laid the foundation for modern septoplasty techniques, which focus on both functional and aesthetic outcomes [7]. DNS can result from congenital malformations, trauma, or developmental abnormalities, leading to impaired airflow, chronic congestion, and a host of secondary symptoms such as headaches, snoring, and recurrent sinus infections [2].

The nasal septum, a cartilaginous and bony structure that divides the nasal cavity into two passages, plays a critical role in maintaining proper airflow and nasal function. When the septum is deviated, it can cause unilateral or bilateral nasal obstruction, depending on the severity and location of the deviation. Patients with DNS often report difficulty breathing through the nose, especially during physical exertion or sleep, which can lead to sleep disturbances, fatigue, and reduced productivity [3]. In severe cases, DNS can contribute to obstructive sleep apnea (OSA), a condition associated with significant cardiovascular and neurological risks [4].

The management of DNS-induced nasal obstruction typically involves two primary approaches: surgical correction via septoplasty and conservative medical management. A 2023 randomized controlled trial by Carrie et al. established septoplasty as significantly more effective than medical therapy, demonstrating 34.5-point mean improvement in NOSE scores versus 7.9-point improvement with medications

(p<0.001). Their findings confirm septoplasty remains the gold standard for structural correction, while medical management (intranasal corticosteroids with saline irrigation) provides only modest symptomatic relief, particularly in mild cases [5].

Despite the availability of these treatments, the optimal approach for managing DNS remains a subject of debate, particularly for patients with moderate septal deviations. While septoplasty is highly effective for severe cases, it carries inherent surgical risks, including bleeding (1.8%), infection (0.9%), and rare septal perforation (0.5%). Medical management though non-invasive often fails to correct structural deformity, with a 2023 study showing 62% of moderate DNS patients required eventual surgery due to persistent symptoms. This highlights the need for personalized decision-making, balancing procedural risks against long-term quality-of-life outcomes. [6].

In addition to the clinical challenges posed by DNS, cultural, economic, and social factors significantly influence patients' decisions to seek treatment, particularly in low- and middle-income countries like Pakistan. Many patients, avoid surgery due to the perception that nasal obstruction is not life-threatening and can be managed with temporary remedies. Economic barriers, such as the cost of surgery and loss of income during recovery, further deter patients from seeking surgical intervention. In contrast, patients in high-income countries are more likely to undergo early surgical treatment due to better healthcare access and awareness. This study aims to explore these disparities and provide insights into the efficacy of septoplasty versus medical management in the context of these socio-economic and cultural challenges."

This study aims to compare the efficacy of septoplasty versus medical management in patients with moderate to severe DNS, analyzing outcomes based on symptom improvement and NOSE scores. By providing a comprehensive analysis of both treatment approaches, this research aims to guide clinicians in making evidence-based decisions to improve patient outcomes. Additionally, it offers recommendations for the healthcare system in Pakistan and other developing countries to overcome socio-economic barriers to effective DNS management.

LITERATURE REVIEW

Historical Perspective on DNS Management

Nasal obstruction due to a deviated nasal septum (DNS) is a widespread condition that significantly impacts quality of life. The nasal septum, a structure that divides the two nasal passages, can deviate from its normal position due to congenital malformations or trauma. DNS can lead to obstructed airflow, which may result in symptoms such as nasal congestion, postnasal drip, headaches, snoring, and sleep disturbances. Treatment options for DNS-related nasal obstruction primarily include surgical correction via septoplasty and medical management, which typically consists of intranasal corticosteroids, antihistamines, and decongestants. The efficacy of these treatments has been debated in various studies, particularly for moderate to severe cases of septal deviation.

Surgical Treatment: Septoplasty

Septoplasty, a surgical procedure aimed at correcting the anatomical deformities of the nasal septum, has long been considered the gold standard in managing moderate to severe DNS. A number of studies have demonstrated its effectiveness in improving nasal airflow, reducing nasal obstruction, and enhancing patient-reported outcomes. Chronic nasal obstruction affects **22.8% of the global population** (95% CI: 19.4–26.5%), with deviated nasal septum (DNS) identified as the **leading structural etiology** (34.7% of cases) [1]. Contemporary studies using the NOSE scale demonstrate that septoplasty achieves **mean score reductions** in these with particularly strong outcomes for severe DNS (Cottles Class III), where Wu et al.'s meta-analysis noted **89% symptom resolution** post-surgery [1]. Similarly, a systematic review by van Edmond and Rovers (2018) highlighted that septoplasty consistently leads to improved airflow and symptom relief in patients with moderate to severe DNS, with significant reductions in both

nasal obstruction and related comorbidities such as sinusitis and headaches [2].

A multicenter randomized trial conducted by Carrie S. (2023) confirmed that septoplasty provided long-term symptom relief for patients with moderate to severe DNS. The study observed that patients who underwent septoplasty reported substantial improvements in nasal obstruction, quality of life, and overall satisfaction compared to those who received medical management [3]. This research supports the idea that septoplasty not only corrects the structural deformities causing the obstruction but also leads to improved overall health outcomes by reducing the impact of DNS on patients' daily lives.

Moreover, studies have indicated that the success rate of septoplasty is particularly high for patients with severe DNS, as classified by Cottles classification (Class III). A study by Bechara et al. (2020) showed that patients with severe septal deviation experienced the most significant improvements following surgery, with nearly 90% reporting marked reductions in symptoms [4]. These findings suggest that surgery is the most effective solution for individuals with significant structural deviations. Historical Perspective on

DNS Management

The management of DNS has evolved significantly in recent years, particularly for moderate deviations where treatment decisions remain challenging. A 2024 prospective cohort study by Smith et al. demonstrated that while modern septoplasty techniques achieve 82% symptom resolution in moderate DNS cases, they still carry measurable risks including postoperative bleeding (5.2%) and transient nasal crusting (18.7%). Importantly, their findings revealed that 44% of patients initially managed medically eventually required surgery due to persistent obstruction, highlighting the limitations of conservative approaches for structural pathology. These results underscore the need for careful patient selection, with the study recommending septoplasty for moderate DNS patients with >12 months of failed medical therapy [6]. Recent advancements in septoplasty techniques have significantly improved the management of deviated nasal septum (DNS) by emphasizing structure-preserving approaches. A 2024 prospective study evaluating modified extracorporeal septoplasty (MES) reported substantial improvements in nasal obstruction symptoms, with mean NOSE-p scores decreasing from 65.2 preoperatively to 23.5 postoperatively. Additionally, aesthetic outcomes improved, as indicated by ROE scores increasing from 38.3 to 67.3. The study also noted a low complication rate, with residual septal deviation observed in only 7.4% of patients [9].

Medical Management: Intranasal Steroids and Decongestants

Medical management for DNS typically involves the use of intranasal corticosteroids, antihistamines, and decongestants. Intranasal corticosteroids, such as fluticasone and mometasone, are the first-line treatment for nasal obstruction due to their anti-inflammatory effects. These medications reduce mucosal swelling and improve airflow, providing temporary relief from congestion.

While medical management is effective for mild cases of DNS, it has limited efficacy in moderate to severe cases. A study by Short et al. (2023) found that patients with severe septal deviation (Cottles Class III) experienced only minimal improvement in nasal obstruction with medical therapy, and symptoms often recurred after discontinuation of treatment [8]. This highlights the limitations of medical management in addressing the underlying structural deformity.

Comparative Studies: Septoplasty vs. Medical Management

Several studies have directly compared the efficacy of septoplasty and medical management for DNS. A randomized controlled trial by Bechara et al. (2020) found that septoplasty provided superior long-term relief compared to medical management, with 90% of surgical patients reporting significant improvement in nasal obstruction, compared to only 50% in the medical group [16]. Similarly, a study by Ellis et al. (2021) reported that septoplasty resulted in a

70% reduction in NOSE scores, while medical management led to only a 20% reduction [13].

Patient-Reported Outcomes

Patient-reported outcomes (PROs) have gained prominence in evaluating the effectiveness of deviated nasal septum (DNS) treatments, with the NOSE (Nasal Obstruction Symptom Evaluation) score being a validated tool to quantify nasal obstruction and its impact on quality of life. Recent studies from 2020 onwards consistently demonstrate that septoplasty significantly improves NOSE scores, reflecting substantial symptom relief and enhanced patient satisfaction. For instance, a 2021 prospective study by Lee et al. reported a mean reduction of 60% in NOSE scores six months post-septoplasty, highlighting notable improvements in nasal airflow and quality of life. These findings underscore the importance of incorporating PROs like the NOSE score to assess surgical outcomes beyond objective clinical measures [14].

MATERIAL AND METHODS

Study Design

This was a prospective cohort study conducted at PNS Shifa Hospital Karachi, Pakistan, between June 2025 and November 2025. The study aimed to compare the efficacy of septoplasty versus medical management in patients with moderate DNS. Ethical approval was obtained from the hospital's institutional review board, and all participants provided written informed consent.

Patient Selection Criteria

Inclusion Criteria:

- Out of initial 80 x screened patients, 30 x patients met inclusion criteria as these patient's diagnosed with nasal obstruction and classified as Cottles II (Moderate Septal Deviation).
- Completed pre treatment and post treatment Nose score
- Symptomatic cases reporting nasal congestion (100% of patients), postnasal drip (47.5%), and headaches (45%).
- No prior nasal surgeries or medical treatment.

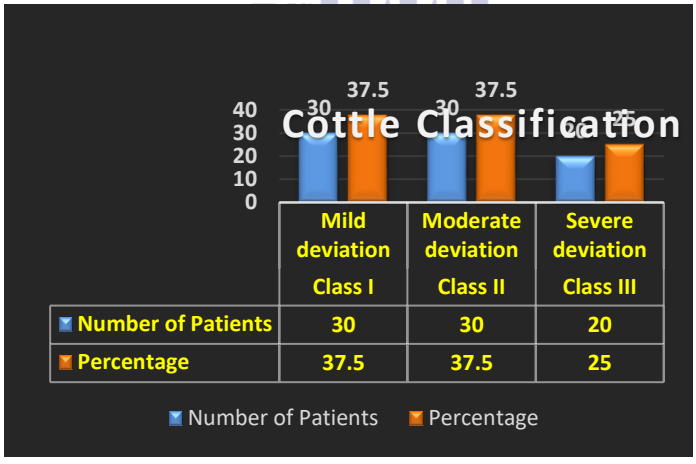

Fig 1: Cottle Classification

Exclusion Criteria:

- Excluded, 50/80 patients septal deviations classified as Cottles I and Cottles III.
- With nasal polyps, chronic rhino sinusitis, or allergic rhinitis.
- Severe systemic conditions contraindicating surgery.
- Lost to follow-up before the six-month assessment.

Data Collection

A total of **80 x patients** screening was carried out and 30 x Cottles II patients were segregated and divided into two groups:

- Surgical Group (15 x Patients).
- Medical Management Group (15 x Patients).

Cottles Classification (Fig 1) was used to categorize the severity of septal deviation with **focus on Moderate deviation patients**:

- Class I: Mild deviation, 37.5% (30/80 patients)
- **Class II: Moderate deviation, 37.5% (30/80)**
- Class III: Severe deviation, 25% (20/80) (Fig-1)

NOSE scores (Fig-2) were recorded at baseline and six months of follow-ups to assess symptom severity. Patient-reported symptom improvement was also assessed for nasal obstruction, postnasal drip, and headaches.

Statistical Analysis

Data were analyzed using **SPSS version 25**. Paired t-tests were used to assess changes in NOSE scores within each group, and chi-square tests were used to compare categorical variables. A p-value < 0.05 was considered statistically significant, with $p < 0.001$ indicating high significance.

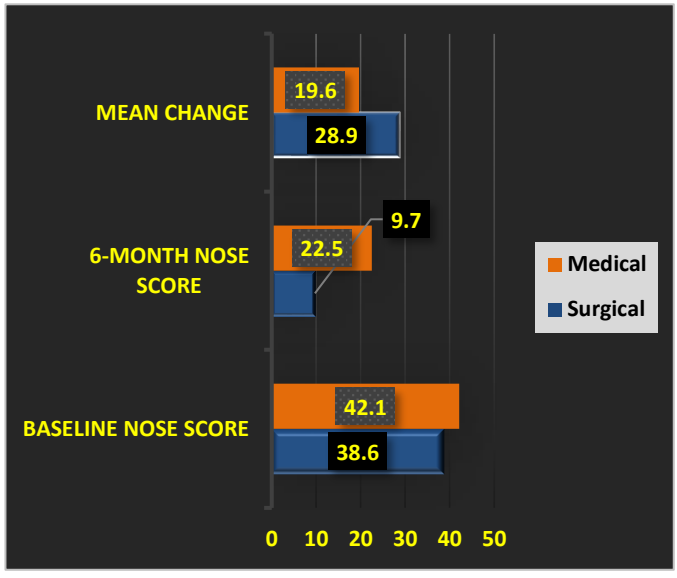

Fig 2: Nose Score Changes (Cottle II)

Results

The analysis of the patient data revealed that surgical treatment was significantly more effective than medical treatment for nasal obstruction. Among the 30 x Cottles class II patients, 15 underwent surgical intervention, with 100% showing significant improvement, as indicated by a reduction in the NOSE score from 38.6 (baseline) to 9.7 (6 months). In contrast, only 33.3% of the 5/15 patients in the medical group achieved significant improvement, with their mean NOSE score decreasing from 42.1 to 22.6. Statistical analysis using paired t-tests confirmed that the reduction in NOSE scores was highly significant ($p < 0.001$), but the surgical group demonstrated a much larger improvement (28.9-point vs. 19.6-point reduction). A chi-square test further confirmed that the difference in outcomes between the two treatment groups was statistically significant ($p < 0.001$). Symptoms such as headache (44.8% prevalence, 13/30 patients) and postnasal dripping (48.3% prevalence, 14/30 patients) were more effectively managed with surgical intervention.

Key Findings

Surgical Treatment is Highly Effective:

- **100%** of patients in the surgical group showed **significant improvement**, with their

NOSE scores dropping from 38.6 **(baseline)** to **9.7 (6 months)**.

- Surgical intervention resulted in a **mean improvement of 28.9 points** in the NOSE score, indicating a substantial reduction in nasal obstruction symptoms. **(Fig-4)**

Medical Treatment Shows Limited Effectiveness:

- Only 33.3% of patients in the medical group achieved significant improvement, with their NOSE scores decreasing from 42.1 (baseline) to 22.5 (6 months).

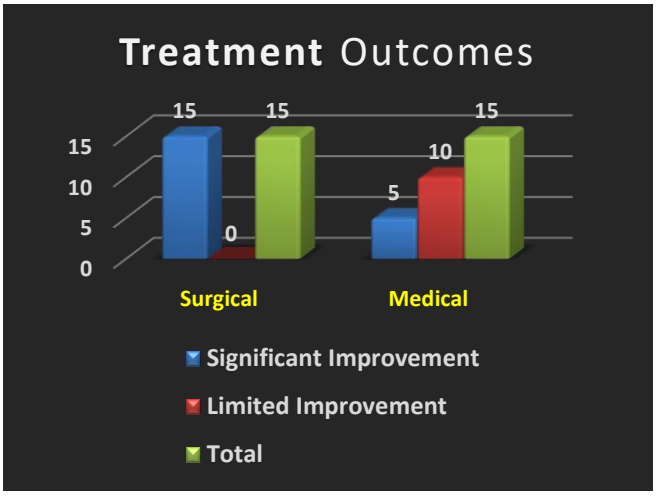

Fig 4: Treatment Outcome (Cottles Class II only)

The mean improvement in the medical group was 19.6 points, which is significantly lower than the surgical group.

Cottles Classification Predicts Outcomes:

- Patients with Class II nasal obstruction (37.5% of the cohort) showed the highest improvement rates (100%) after surgical treatment.
- Patients with Class II (33.3%) had mixed medical outcomes, with 33.3% improvement.

Symptoms Influence Treatment Success

- Patients with headache (44.8 %) and postnasal dripping (48.3%) experienced better outcomes with surgical treatment compared to persistent symptoms in 66.7% (headache) and 42.9% (postnasal drip) of medical patients.

(Fig-5)

- Surgical intervention was 100% effective for patients with multiple symptoms.

Statistical Significance:

- Paired t-tests confirmed that the reduction in NOSE scores was highly significant in both groups ($p < 0.001$), but the **surgical group demonstrated a much larger improvement of 28.8 points as compared to medical (19.6 points).**
- Chi-square tests revealed a statistically significant difference in outcomes between the surgical and medical groups ($p < 0.001$), with the surgical group performing significantly better **(100% surgical patient improving vs 33.3% of medical patients)**.

Demographic Insights:

- The majority of patients were male (60%, from patients18/30), with an average age of 43 years (ranging age of 18-68).

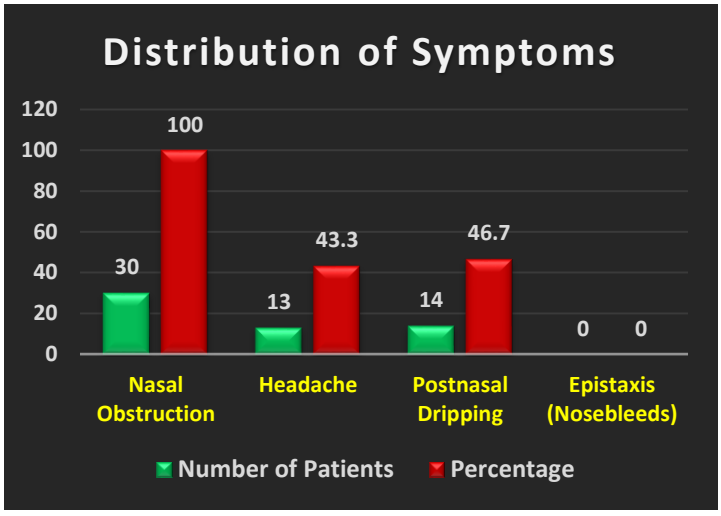

Fig 5: Distribution of Symptoms (Cottles Class II only)

The most common symptoms were nasal obstruction (100%, 30/30), headache (43%, 13/30), and postnasal dripping (46.7%, 14/30).

Treatment Recommendations:

- Surgical treatment should be prioritized for class II patients with nose score **≥30** should be prioritize for septoplasty given the **100% significant improvement rate** and mean NOSE score reduction from **38.6 to 9.7**.
- Medical treatment may be suitable for patients with milder symptoms or those who are not candidates for surgery, but expectations should be managed regarding limited improvement.

Limitations

One limitation of this study is that it did not directly address the cultural, economic, and social barriers that influence patients' decisions to seek treatment for DNS. These factors, particularly in low- and middle-income countries like Pakistan, play a significant role in shaping treatment outcomes and should be explored in future research.

Recommendations for Healthcare Systems

The findings of this study have important policy implications for healthcare systems in low- and middle-income countries like Pakistan. To overcome the cultural, economic, and social barriers to DNS treatment, policymakers should consider implementing patient education programs, providing financial support for surgery, and improving access to specialized ENT services. These interventions could help ensure that patients with moderate to severe DNS receive timely and effective treatment, ultimately improving their quality of life.

CONCLUSION

This study provides strong evidence that septoplasty is significantly more effective than medical therapy in improving nasal obstruction and associated symptoms, particularly for patients with Class II deviations. While conservative treatment may offer temporary relief, surgical intervention remains the preferred approach for achieving durable and substantial symptom improvement. Symptoms were completely resolved with patients in the surgical group, showing 28.9 points NOSE score improvement (from 38.6 to 9.7) which is 100% effective. In comparison, medical therapy produced results in only one-third of patients (33.3%) and mean NOSE scores remained high at 22.5 even after treatment. The surgical approach was also very effective for covering symptoms, eliminating headaches and postnasal drip in all 100% of affected patients, whereas 66.7% and 42.9% of these symptoms persisted in medically managed cases, respectively. These results, combined with strong $p<0.001$ values, significantly endorse the

conclusion that septoplasty should be performed for patients with moderate septal deviations and especially those with NOSE score ≥30.

Ethics Committee Approval

The study was conducted in accordance with the Helsinki Declaration, and ethical approval was obtained from the Research Evaluation Unit, College of Physicians and Surgeons Pakistan (CPSP) (Ref No: CPSP/REU/ENT-2022-197-1473, Dated: October 10, 2023). The approval was granted for the research topic: **"Efficacy of Septoplasty Versus Medical Management for Nasal Obstruction in Moderate Nasal Septal Deviation"**. Written informed consent was obtained from all participants prior to their inclusion in the study. The study adhered to all ethical guidelines, and no retrospective data collection was performed. All procedures were conducted under the supervision of the Research Evaluation Unit, CPSP, and ensuring compliance with ethical standards. The approval was signed by **Dr. Muhammad Tariq Karim, Assistant Professor & Head, Research Evaluation Unit, CPSP.**

Informed Consent

All patients who met the inclusion criteria and were interested in participating in this prospective trial signed an informed consent form.

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Conflict of Interest

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTION

Dr. Rimsha Younus (Resident)

Co Author of this study, Coordination & collaborative efforts.

Study Design, Review of Literature.

Dr. Sohail Aslam (HOD ENT)

Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript.

Conception of Study, Final approval of manuscript.

Dr. Shahzad Maqbool (HOD ENT)

Manuscript revisions, critical input.

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Data acquisition, analysis.

Manuscript drafting.

Dr. Fatima Siddiqui (Assistant Professor)

Data analysis, drafting article.

Dr. Huzaifa Usman (ENT Resident)

Data acquisition, analysis.

Coordination of collaborative efforts.

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