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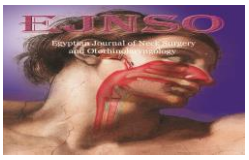

Comparison of Surgical Outcomes and Intraopertive Complications between Endoscopic and Conventional Septoplasty a meta-analysis study

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Abstract:

Objective: The objective of this research was to compare between endoscopic and conventional septoplasty through a meta-analysis study.

Patients and methods: In this meta-analysis we enrolled 22 articles fulfilled inclusion criteria as having symptomatic deviated nasal septum (headache, nasal obstruction, hyposmia and epistaxis) and refractory to medical treatment that diagnosed clinically, radiological and endoscopically having deviated nasal septum or spur.

Results; Endoscopic septoplasty offer advantages, with fewer complications compared with traditional open technique; According to the study, patients reported better improvement after endoscopic septoplasty over conventional septoplasty regarding: headache (RR = 0.12, 95% CI = 0.05 to 0.18, I^2 =0. 01%, P value = 0. 948), nasal obstruction (RR = 0.14, 95% CI = -0.08 to 0.20, I^2 =43.14%, P value = 0. 003) and posterior nasal drip. Endoscopic septoplasty performed much better according to objective parameters; persistent posterior deviation, residual septal deviation and residual spur (RR= -1.58, 95% CI = -2.39 to -0.76, I^2 =0%, P value =0. 967). Endoscopic septoplasty was safer than conventional approach in occurrence of facial swelling, postoperative hemorrhage, mucosal tear, length of postoperative stay, septal hematoma (RR= -1.45, 95% CI = -2.82 to -0.09, I^2 =0%, P value =1.000), septal perforation also nasal pain and synechiae.

Conclusions: Patients with endoscopic septoplasty had better outcome regarding nasal blockage, postnasal drip, headache and septal deviation. Furthermore, Endoscopic septoplasty reported safer result than conventional approach as it reduces residual pain, facial swelling, postoperative hemorrhage, mucosal tear, and length of postoperative stay, septal hematoma, septal perforation, nasal pain, and synechiae.

Keywords: Surgical outcomes, intraoperative complications, endoscopic and conventional septoplasty

Introduction

The nasal septum is typically straight from birth and stays that way throughout childhood. The septum has a tendency to flex to one side with age. Injury from birth trauma, such as the use of forceps or passing via a narrow pelvic canal, can result in an early septal deviation or a deviation that is not noticeable until a more active stage of growth during puberty. [1]

One of the most frequent issues otorhinolaryngologists see in their daily practice is nasal blockage. One of the most typical reasons of nasal obstruction is a deviated nasal septum. In addition to making breathing difficult, it also leads to poor paranasal sinus aeration, which

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increases the risk of sinusitis, and dry mucosa, which causes crusting and epistaxis. [2]

A number of operations have been suggested to treat the deviated nasal septum. Since its establishment, it has experienced a number of alterations. Initially, a drastic procedure called submucous excision of the septum—which came with a number of complications—was performed. Later septoplasty was used instead because it had fewer problems and required less septum excision. [3] In 1991, **Lanza et al. and Stammberger** first detailed the use of endoscopic methods to treat isolated septal spurs and septal deviation. [4]

The endoscopic modality enhances vision and operative field magnification while offering a direct, targeted path to the anatomic abnormality. It makes it possible to check the middle meatus concurrently with the posterior septal deviations and determine the extent of mucosal engrossment of the posterior part of the inferior nasal turbinates. It allows for the objective recording of the nasal blockage site and the potential for outcome prediction. [5]

To compare between endoscopic and conventional septoplasty through a meta-analysis study. Ethical approval was taken from Institutional Review Board from Ain Shams University committee with IRB code (FMASU MS 631/2021).

Patients and methods:

The research will be fulfilling the following steps:

Target selection, article location and identification, screening and assessment, data gathering, reporting and interpretation, dialogue and advice.

I-Target determination

To compare between endoscopic and conventional septoplasty through a meta-analysis study.

II- Identification and location of articles:

Studies involved published medical research concerning endoscopic and conventional septoplasty through searching different databases such as MEDLINE, web of science (WOS), SCOPUS and PUBMED until December 2022 using the following keywords in different combinations: Endoscopic septoplasty, conventional septoplasty, traditional septoplasty, septoplasty, endoscopic approach, deviated nasal septum

III) Screening and evaluation:

The investigators blinded the author's name and the journal of publication before using the screening system of articles to filter the articles that the search engine returned.

For the purposes of data collection, analysis, and reporting, only articles that met all inclusion requirements were included. These articles were also vetted in accordance with inclusive criteria.

Involved articles: (22) Articles which met the inclusion criteria: Published in English language, prospective randomized study, comparing endoscopic and classic septoplasty published between 1991 and 2022, conducted on human subjects.

Those articles fulfilled inclusion criteria for participants: patients age above 15 years old, having symptomatic deviated nasal septum (headache, nasal obstruction, hyposmia and epistaxis) and refractory to medical treatment, patients diagnosed clinically, radiological and endoscopically having deviated nasal septum or spur.

Excluded articles:

Those are articles which fulfilled the following exclusion criteria: published in other languages "not in English", retrospective and descriptive studies,

articles published before 1991, conducted on animals.

Those articles fulfilled exclusion criteria for participants: patients having acute rhinosinusitis, upper respiratory tract infection, allergic rhinitis, nasal malignancy, revision case, patients need septorhinoplasty, patients unable to follow up for 3 months postoperative, general condition that precludes elective surgery.

Statistical analysis:

R version 4.2.2 (R Core Team, 2022) [6] and the meta for package [7] were used for analysis.

Heterogeneity assessment:

The included studies were evaluated for heterogeneity of the evaluations using the following tests:

1. Cochran Q chi square: A significant test (P-value <0.1) referred heterogeneity among the studies.
2. I-square (I^2) index is interpreted heterogeneity as follows:
   - I^2 = 0% to 40%: unimportant
   - I^2 = 30% to 60%: moderate
   - I^2 = 50% to 90%: substantial
   - I^2 = 75% to 100%: considerable

Publication bias evaluation:

Evaluation was done by

- Analyzing funnel plots that display the estimated outcome size on the horizontal axis and a study size measure (the effect size's standard error) on the vertical axis.
- The Begg-Mazumdar rank correlation test.
- The Egger regression test.

Pooling of estimates:

The risk ratio (RR) with 95% confidence intervals (CI) is used to express binary outcomes. Utilizing a restricted maximum likelihood (RML) random-effects model (REM), estimates from the included studies were combined.

Results

The searched databases, included Medline (Ovid), Scopus, PubMed and the web of science (WOS) from 1991 to 2022. The search retrieved 328 records after removing the duplications. Then 28 eligible studies for full-texts were retained for screening. Finally, 22 articles were involved (Figure 1: Prizma chart and Table 1 showed the Included articles).

The outcomes measured:

The outcomes divided to subjective improvement, objective improvement and complications.

1.1. Subjective improvement

Our results regarding subjective improvement were summarized in table 2 and additional data are given in supplementary figure 2-8

1.2. Objective improvement

Table 3 showing results of objective improvement, for more illustration in supplementary figure 9-13.

1.3. Complications

For more illustration in Table 4 and supplementary figure 14-21.

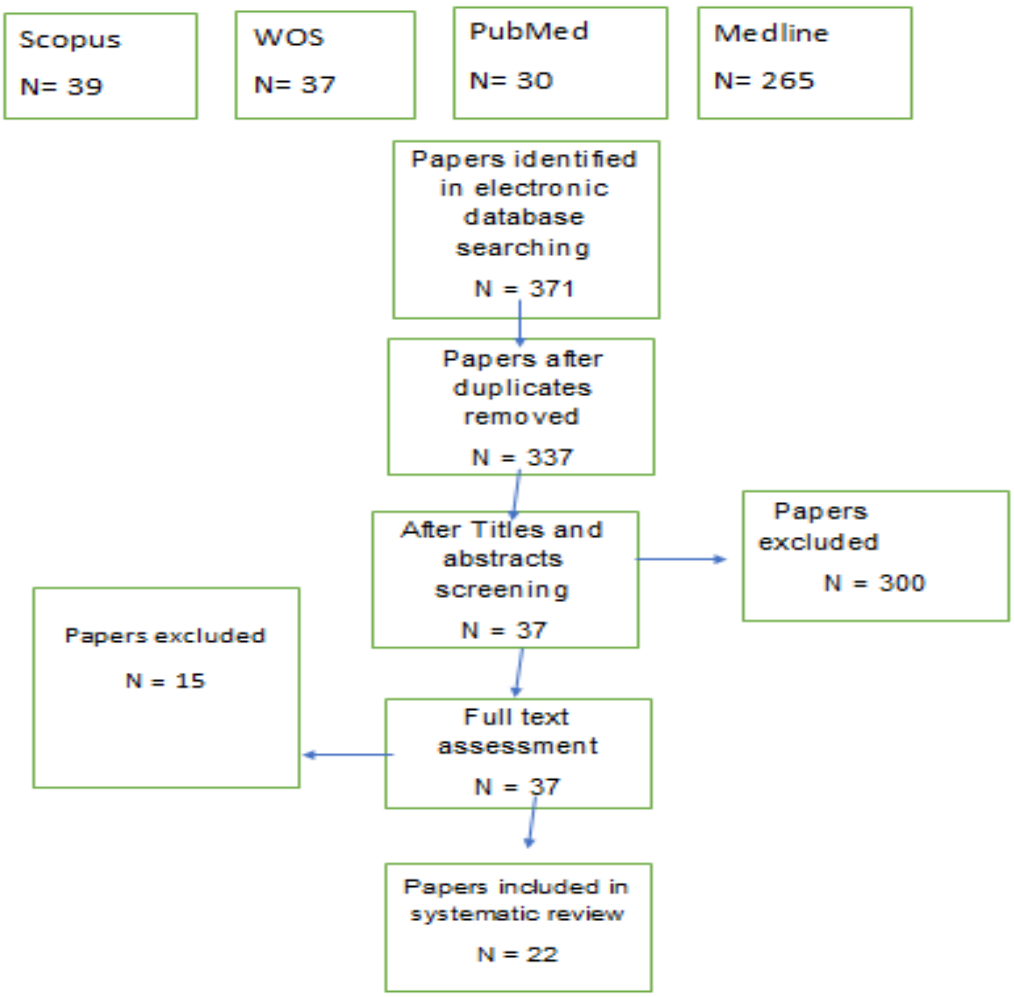

Figure 1: Prizma flow chart

Table 1: Included articles

NO	Study ID	Title
1	Bothra et al., 2008 [8]	Comparative evaluation of conventional versus endoscopic septoplasty for limited septal deviation and spur
2	Doomra et al., 2019 [9]	Evaluating Surgical Outcomes of Conventional Versus Endoscopic Septoplasty Using Subjective and Objective Methods
3	Garzaro et al., 2019 [10]	Endoscopic versus conventional septoplasty objective/subjective data on 276 patients
4	Gulati et al., 2009 [11]	Comparative evaluation of endoscopic with conventional septoplasty
5	Gupta et al., 2005 [2]	Compartive study of endscopic aided septoplasty and traditional Septoplasty in posterior nasal septal devitations
6	Iqbal et al., 2013 [12]	A comparative study of endoscopic verses conventional septoplasty: An analysis of 110 cases
7	Nasrallah et al., 2020 [13]	Endoscopic versus conventional septoplasty in the treatment of obstructive nasal septal deviation
8	Kalpana et al., 2015 [14]	Endoscopic Versus Conventionanl Septoplasty: Our Institutional Experience
9	Nasr et al., 2018 [15]	Assessment of the nasal obstruction after endoscopic septoplasty compared with conventional technique by computed tomography and

		Nasal Surgical Questionnaire
10	Islamma et al., 2021 [16]	Open versus Endoscopie Septoplasty: A Single-Blinded, Randomized, Controlled Trial
11	Salma 2014 [17]	Endoscopic Aided Septoplasty Versus Conventional Septoplasty
12	Sathyaki et al., 2013 [3]	A Comparative Study of Endoscopic Septoplasty Versus Conventional Septoplasty
13	Shehata et al., 2012 [18]	Endscopic versus traditional septoplasty
14	Sherif et al., 2015 [19]	Endoscopic-assisted septoplasty versus traditional septoplasty: assessment by the NOSE scale
15	Shrestha et al., 2017 [20]	Study to Compare and Evaluate Traditional vs. Endoscopic Septoplasty
16	Singh et al., 2015 [21]	Thw compartive study of conventional septoplasty and endscopic septoplasty
17	Suraneni et al., 2018 [22]	Conventional vs. endoscopic septoplasty: our experience
18	Talluri et al., 2014 [23]	Correction of Deviated Nasal Septum: Conventional Vs Endoscopic Septoplasty
19	Verma et al., 2016 [24]	Comparative Evaluation of Conventional Versus Endoscopic Septoplasty for Deviated Nasal Septum
20	Kaushik et al., 2013 [25]	Endscopic VS Conventional sepyoplasty : A comparitve study
21	Yadav et al., 2016 [26]	Comparative Study of Endoscopic Septoplasty vs Conventional Septoplasty
22	Gad et al., 2020 [27]	Endoscopic Verses Conventional Septoplasty in the Treatment of Deviated Nasal Septum

Table 2: Subjective criteria

Subjective criteria	Results
Headache	There is no heterogeneity (I-squared = 0.01%, Cochran Q p =. 948). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log RR = 0.12, 95% CI = 0.05 to 0.18).
Nasal obstruction	There is moderate heterogeneity (I-squared = 43.14%, Cochran Q p =. 003). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log RR = 0.14, 95% CI = -0.08 to 0.20).
Nasal discharge	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 380). Difference between groups is not statistically significant (log RR = 0.04, 95% CI = -0.4 to 0.11).
Posterior nasal drip	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 921). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log RR = 0.22, 95% CI = 0.05 to 0.39).
Epistaxis	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 740). Difference between groups is not statistically significant (log RR = 0.58, 95% CI = -1.26 to 2.43).
Hyposmia	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 901). Difference between groups is not statistically significant (log RR = 0.17, 95% CI = -0.11 to 0.44).
Sneezing	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 611). Difference between groups is not statistically significant (log RR = -0.06, 95% CI = -0.36 to 0.23).

RR; Risk ratio

Table 3: Objective criteria

Objective criteria	Results
Persistant residual deviation	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 995). Difference between groups is statistically significant favoring

	endoscopic over conventional septoplasty (log risk ratio = -0.89, 95% CI = -1.31 to -0.48).
Persistant anterior deviation	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 900). Difference between groups is not significant (log RR = -0.11, 95% CI = -0.95 to 0.72).
Persistant Posterior deviation	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 920). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log RR = -1.18, 95% CI = -1.72 to -0.63).
Persistant hypertrophy of turbinates	There is unimportant heterogeneity (I-squared = 9.28%, Cochran Q p =. 340). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log RR = -0.95, 95% CI = -1.87 to -0.04)
Persistant residual spur	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 967). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log RR = -1.58, 95% CI = -2.39 to -0.76).

Table 4 Showing results regarding complications

Facial swelling:	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 985). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -1.20, 95% CI = -2.00 to -0.40).
Postoperative hemorrhage:	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 960). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -1.18, 95% CI = -1.69 to -0.66).
Mucosal tear:	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 692). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -0.73, 95% CI = -1.08 to -0.37).
Postoperative stay:	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 956). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -1.50, 95% CI = -2.07 to -0.93).
Septal hematoma:	There is no heterogeneity (I-squared = 0%, Cochran Q p = 1.000). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -1.45, 95% CI = -2.82 to -0.09).
Septal perforation:	There is no heterogeneity (I-squared = 0%, Cochran Q p = 1.000). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -1.46, 95% CI = -2.61 to -0.31).
Synechiae:	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 761). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -1.25, 95% CI = -1.67 to -0.83).
Nasal pain:	There is no heterogeneity (I-squared = 0%, Cochran Q p =. 984). Difference between groups is statistically significant favoring endoscopic over conventional septoplasty (log risk ratio = -1.02, 95% CI = -1.99 to -0.05).

Discussion:

It was Killian [28] and Freer [29] who initially advanced the concept of septoplasty. more than a century ago,

and Cottle established surgical septoplasty as a treatment for nasal airway obstruction in 1947 by standardizing the process.

In 1991, Stammberger was the first to describe the use of endoscopic techniques to treat septal abnormalities. Since then, endoscopic septoplasty has been used to improve surgical access to the middle meatus and relieve symptomatic nasal obstruction in conjunction with endoscopic surgery of the paranasal sinuses. [30]

Although a number of surgical procedures have been planned to treat deviated septum, none of them have been able to fully restore the nasal airway. The following requirements should be met by the perfect septum correction: (1) Nasal obstruction relief; (2) conservative procedure; (3) Osteometal complex preservation; (4) Needs room for revision surgery, should it be necessary in the future. [3]

Although they do not fulfill the prior requirements, traditional septal modification techniques do improve airway. The drawbacks of traditional operations include inadequate lighting and visualization, challenges in precisely identifying the pathology, overexposure, the need for nasal packing, and the need to manipulate the septal framework, which makes revision procedures challenging. [10]

A direct, focused treatment for septal anatomic abnormality that is minimally invasive is endoscopic septoplasty. [2] It permits the excision of a little cartilaginous and/or bony malformation and limited septal flap dissection. Improved lighting and visualization aid in increasing surgical precision while minimizing septal flap exposure. [3]

The objective of our work was to compare between endoscopic and conventional septoplasty through a meta-analysis study; Our meta-analysis compares several significant clinical results of the two surgical procedures, offering a critical evaluation of pooled summary estimates.

In this meta-analysis we enrolled 22 articles fulfilled inclusion criteria as having symptomatic deviated nasal septum (headache, nasal obstruction, hyposmia and epistaxis) and refractory to medical treatment that diagnosed clinically, radiological and endoscopically having deviated nasal septum or spur.

Our main conclusion was that the endoscopic septoplasty technique appeared to have benefits over the conventional procedure, with fewer overall issues. In terms of subjective improvement, endoscopic septoplasty produced better results than conventional septoplasty in the following areas: headache (17 studies, RR = 0.12, [95% CI = 0.05 - 0.18, I2 = 0. 01%, P value = 0. 948), nasal obstruction (17 studies). posterior nasal drip (8 studies); RR = 0.14, 95% [CI = -0.08 - 0.20], I2 43.14%, P value = 0. 003). P value = 0.921). RR = 0.22, 95% [CI = 0.05 - 0.39], I2 = 0%. On the other hand, there was no discernible variation in sneezing, nasal discharge, epistaxis, or hyposmia (P>0.05).

In accordance with **Hong et al.** [31], the meta-analysis, which included fourteen studies, aimed to study the safety and efficacy of open versus endoscopic septoplasty. The combined results of these studies showed a statistically significant improvement in patients treated with endoscopic septoplasty for contact point nasal headaches (5 studies: RR 2.65 [95% CI, 1.11–6.30], I2 0%, p 0.03) and obstruction (8 studies: RR 3.70 [95% CI, 2.13–6.43], I2 0%, p 0.001).

Similar to this, a study by **Kour et al.** [32] evaluated the benefits and potential drawbacks of endoscopic septoplasty when compared to the classical approach. patients with headaches and

nasal blockage treated with endoscopy showed a significant improvement when compared to the conventional group.

Furthermore, a substantial reduction in nasal obstruction and headache was noted by **Kim et al** in 2011 [33] and **Kim et al** in 2012 [34] in the group that had endoscopic septoplasty. These findings further highlighted the significance of minimal nasal packing following septoplasty in the patients' future development.

Furthermore, **Bajwa**, 2018 found that the endoscopic approach was less problematic than the conventional technique during his study of 100 patients undergoing the procedure. Following endoscopic septoplasty, 10.0% of patients experienced nasal blockage, 6.7% experienced postnasal drip, and 16.7% experienced headaches. Similarly, following surgery, 13.3% of patients receiving conventional septoplasty experienced nasal blockage, 10.0% experienced postnasal drip, and 26.7% experienced headaches. [26]

On the other hand, **Paradis and Rotenberg** [35] found that while there were no appreciable differences between endoscopic and classical septoplasty, following 63 patients' endoscopic and classical surgery for septal deviation, there were reported improvements in both groups' nasal obstructive symptoms.

Suligavi demonstrated a considerable variation between classical group [13 patients (26%)] and endoscopic patients [7 cases (14%)] for epistaxis that differ with our findings. [36]

The current meta-analysis pooled estimate illustrated that endoscopy showing significant better objective improvement for reduction of turbinates hypertrophy (RR= -0.95, 95% CI = -1.87 to -0.04, I2 =9.28%, P value =0. 340), persistent posterior deviation (RR= -1.18, 95% CI = -1.72 to -0.63, I2 =0%, P value =0. 920), residual septal deviation (RR= -0.89, 95% CI = -1.31 to -0.48, I2 =0%, P value =0. 995), and residual spur (RR= -1.58, 95% CI = -2.39 to -0.76, I2 =0%, P value =0. 967).

Uz and Eskiizmir [37], on the other hand, found no difference in the results and quality of life between patients who had conventional septoplasty and ES without additional nasal procedures in terms of persistent deviation (CS: 7/36, ES: 2/35; p=0.151). With regard to **Hong et al.,** [31] there were more better results for endoscopy than conventional approach for persistent septal deviation (nine studies: RR 2.09 [95% CI, 1.44–3.04], I2 0%, p 0.001).

On the other hand, 10 patients (20%) with a persistent septal turbinate, 5 patients (10%) with a persistent anterior deviation, and 2 patients (3%) with a persistent posterior deviation were part of the endoscopic septoplasty group. In the conventional septoplasty group, there were 12 patients (23%) with a persistent posterior deviation, 7 patients (13%) with a persistent anterior deviation, and 7 patients (13%) with a persistent spur deviation, per Jain's study. There was no statistically significant difference in the sustained septal turbinate contact. [38]

Our research appears to show that a statistically significant smaller percentage of endoscopic patients than those undergoing traditional surgery had an incomplete repair of the aberration. Furthermore, posterior deviations that could otherwise go unnoticed or untreated can be managed more easily thanks to endoscopic magnification of the entire nasal cavity.

The endoscope can be easily and gently inserted beneath the septal mucosa for the best possible vision. The incision can be made more posteriorly, inside the nose, and in the exact location of the deviation, which is an added benefit in lowering postoperative edema. The anterior surface of the

detached septal mucosa is significantly reduced as a result. [13]

Regarding complication in the present meta-analysis; endoscopic septoplasty was safer than conventional approach in the occurrence of facial swelling (RR= -1.20, 95% CI = -2.00 to -0.40, I2 =0%, P value =0. 985), postoperative hemorrhage (RR= -1.18, 95% CI = -1.69 to -0.66, I2 =0%, P value =0. 960), mucosal tear (RR= -0.73, 95% CI = -1.08 to -0.37, I2 =0%, P value =0. 692), length of postoperative stay (RR= -1.50, 95% CI = -2.07 to -0.93, I2 =0%, P value =0. 956), septal hematoma (RR= -1.45, 95% CI = -2.82 to -0.09, I2 =0%, P value =1.000), septal perforation (RR= -1.46, 95% CI = -2.61 to -0.31, I2 =0%, P value =1.000), nasal pain (RR= -1.02, 95% CI = -1.99 to -0.05, I2 =0%, P value =0.984), and synechiae (RR= -1.25, 95% CI = -1.67 to -0.83, I2 =0%, P value =0. 761).

Hong et al.,[31] also discovered additional problems related to the open septoplasty technique: mucosal adhesions and/or synechiae (13 studies: RR 3.30 [95% CI, 1.49–7.31], I 2 46%, p 0.003), intra- or postoperative hemorrhage (7 studies: RR 2.62 [95% CI, 1.45–4.71], I2 0%, p 0.001), and septal tears. They disagree with us because there was no discernible variation in the additional complications measurements, such as septal perforation and septal hematoma.

In current study, the postoperative hematomas were less after endoscopic septoplasty. Furthermore, **Raynor,** [39] noted that none of the endoscopic septoplasty patients had any septal hematomas or perforations**.** Because there are no mucosal flap sutures, the incision's unsutured limb serves as a blood drain.

The development of postoperative synechiae is another intriguing criterion to compare the techniques: in the current meta-analysis, the endoscopic group's percentage of incidence was much lower than that of the traditional group, along the same lines as **Paradis and Rotenberg**, [35]**.** found that patients in the endoscopic septoplasty group had much fewer postoperative synechiae produced than individuals in the conventional septoplasty group. **Jain, 2011** [38] reported similar results. Additionally, **Suligavi,** [33] discovered a statistically significant difference between the two groups: 10 cases (20%) in the traditional group and only three individuals (6%) in the endoscopic group developed synechiae.

Furthermore, **Kim,** [34] pointed out that compared to the conventional septoplasty group, the endoscopic septoplasty group had a significantly lower rate of synechiae formation. Conversely, **Uz and Eskiizmir**, [37] reported that there was no difference in septal perforation or synechiae between the two groups. However, compared to the conventional group, the endoscopic category's incidence of intraoperative mucosal flap laceration was significantly lower.

Early in the surgery, a reduced submucoperichondrial dissection can be obtained thanks to endoscopic imaging. Furthermore, a direct verification of the proper attachment of the mucosal flap following septoplasty is possible. The two most important steps to prevent mucosal injury and, hence, lower the chance of developing synechiae are initial restricted detachment and final mucosal repositioning. [10]

An additional advantage of the endoscopic modality is its ease of preservation of at least one mucosal surface side, preventing tearings that may result in a perforation. This was seen in this study, where the endoscopy group had a significantly lower incidence of perforation.

Endoscopic septoplasty is a better option than traditional septoplasty for

the following reasons: (1) It makes pathology easier to accurately identify. (2) It raises spur visibility and accessibility, posterior deviation, and both. (3) Because endoscopic septoplasty minimizes the dissecting area, patients with isolated spurs benefit greatly from this procedure. (4) This teaching approach is very successful. (5) It improves the identification of lateral wall pathology linked to septal deformity. (6) Similar instruments are used in endoscopic septoplasty and endoscopic sinus surgery (FESS). (7) It allows for the precise identification of the flap elevation cleavage planes, particularly in trauma or revision patients. Tears and perforations are therefore less likely to occur. (8) Another advantage of elevating the flap in the proper plane is a reduction in intraoperative bleeding. (9) It assists in case documentation.

However, nasal endoscopy had some disadvantages, such as: (1) loss of binocular vision. Because of its close proximity to the surgical field, the nasal endoscope frequently experiences tip soiling, necessitating periodic endoscope tip cleaning. (3) No bimanual task is completed.

Conclusion:

Patients with endoscopic septoplasty had better consequence regarding nasal obstruction, headache, postnasal drip and the persistent septal deviation. Furthermore, Endoscopic technique reported safer result than conventional approach as it reduces residual pain, facial swelling, postoperative hemorrhage, mucosal tear, and length of postoperative stay, septal hematoma, septal perforation, nasal pain, and synechiae.

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Conflicts of interest: No

Reference:

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