

## Endoscopic Versus Conventional Septoplasty: Our Institutional Experience

Kalpana Th<sup>1</sup>, Jiten N<sup>2</sup>, Sudhiranjan Th<sup>3</sup>, Sobita P<sup>4</sup>, Anita N<sup>5</sup>, Gyan R<sup>6</sup>

<sup>1</sup>Ex-Resident, Dept of Otorhinolaryngology, Regional Institute of Medical Sciences, Imphal, India.)

<sup>2</sup>Senior Resident, Dept of Otorhinolaryngology, Regional Institute of Medical Sciences, Imphal, India.)

<sup>3</sup>Professor, Dept of Otorhinolaryngology, Regional Institute of Medical Sciences, Imphal, India.)

<sup>4</sup>Assistant Prof, Dept of Otorhinolaryngology, Regional Institute of Medical Sciences, Imphal, India.)

<sup>5</sup>Assistant Prof, Dept of Anaesthesiology, Regional Institute of Medical Sciences, Imphal, India.)

<sup>6</sup>Junior Resident, Dept of Otorhinolaryngology, Regional Institute of Medical Sciences, Imphal, India.)

---

### Abstract:

**Purpose:** To assess advantages and disadvantages of endoscopic septoplasty and to compare post-operative results and complications of endoscopic with conventional septoplasty.

**Materials and Methods:** A total of 50 (fifty) patients with symptomatic deviated nasal septum were prospectively studied. Patients were divided into two equal groups. One group underwent endoscopic septoplasty and the other group underwent traditional septoplasty under general anaesthesia. A detailed history and thorough examinations were carried out on all selected patients, using a pre-designed proforma. Subjective and objective assessments were done both pre- and post-operatively. Patients were followed upto three months post-operatively. Comparisons were made for relief of symptoms of nasal obstruction, headache, recurrent rhinorrhoea, hyposmia and post nasal drip after the surgery in both the groups under study and also post-operative complaints like haemorrhage, facial swelling, nasal pain and duration of hospital stay in both the study groups. Appropriate statistical tools were used for analysis of data.

**Results:** In the study, there were 38 males (76%) and 12 females (24%). The most commonly affected subjects belonged to the 2nd and 3rd decade of life. The mean age was 28.00yrs with a Std. Deviation  $\pm$  8.64. In the study subjects, the most common pre-operative complaint was nasal obstruction (86%) followed by anterior nasal discharge (52%), headache (36%), post nasal drip (44%) and hyposmia (14%). Subjectively 90% of patients who underwent endoscopic septoplasty (ES) and 82.60% of those who underwent traditional septoplasty (TS) were relieved of nasal obstruction while headache was relieved in 87.50% of ES group and 60% of TS group. Rhinorrhoea, postnasal drip and hyposmia were relieved in 75%, 80% and 66.66% of ES group respectively, while these were relieved in 85.71%, 75% and 50% of TS group. The differences of symptomatic relief in both groups were statistically not significant ( $p > 0.05$ ). Immediate complications like nasal bleeding, nasal pain, facial swelling and septal perforation following surgery were higher in traditional septoplasty group, but these were not statistically significant ( $p > 0.05$ ). Patients who underwent traditional septoplasty had longer hospital stay ( $>48$  hrs) as compared to those who underwent endoscopic septoplasty ( $p < 0.05$ ). Assessment at 01 month showed no statistically significant residual anterior deviation in both the groups ( $p > 0.05$ ). However, there was statistically significant residual posterior deviation and persistent spur between the groups ( $p < 0.05$ ). Synechia developed in 5(20%) of traditional group and none in endoscopic group, which was significant ( $p < 0.05$ ). Similar results were found during objective assessment at 03 month post-operatively.

**Conclusion:** In our study, we found better results and fewer complications for endoscopic septoplasty compared with traditional septoplasty, as endoscopy gave better illumination and access to posterior deviations and spurs.

**Keywords:** Septoplasty, Endoscopic, advantages and disadvantages.

---

### I. Introduction

Septoplasty is a well-described surgical technique for management of nasal airway obstruction. The advances in endoscopic techniques have facilitated endoscopic septoplasty. It is a minimally invasive technique that helps us to correct deformity of septum under excellent visualization. [1]The technique allows for enhanced visualization of the septal deviation with more focused flap dissection and resection of the offending cartilage and bone.[2]

Stammberger and Lanza et al initially described the application of endoscopic techniques to the correction of septal deformity in 1991. [3, 4]This endoscopic approach provides a direct-targeted route to the anatomic deformity, improved visualization, and magnification of the surgical field. It allows improved evaluation of the posterior nasal septal deformities, identification of the degree of mucosal involvement of the

posterior ends of the inferior turbinates, and concomitant assessment of the middle meatus. It permits objective documentation of the cause of nasal obstruction with possible use in outcome assessment. [5]The systematic use of endoscope in the sinonasal region has made it possible to assess the nasal septum with more precision.[6]Also, endoscopic septoplasty is an excellent teaching tool when used in conjunction with video monitor.[2]

The conventional approach to septoplasty involves headlight illumination and visualization through a nasal speculum. With this traditional approach the visualization is impaired and which may relatively call for more exposure by a large incision and by elevation of flaps on both sides of septum predisposing to nasal mucosal trauma. Endoscopic approach to septoplasty provides several advantages over the standard head light technique. Endoscopic septoplasty provides a significantly improved field of view particularly in more posterior deviations. Endoscope can be passed easily under septal mucosal flaps, minimal lifting of flap is required to gain excellent visualization. Incision can be performed more posterior in the nose immediately anterior to the area of deviation; the extent of mucosal elevation anteriorly in the nose is minimized.[1]

This technique is not an open approach but permits one to see more of the nasal skeleton and bony septum, the cause of deformity, and immediate effect of the corrective measures used. The use of the endoscope in the corrective septoplasty for deviated noses provides an expanded field of vision, direct manipulation of lesions, and better aesthetic and functional result.[7]The primary advantage of the technique is ability to decrease morbidity and postoperative swelling in isolated septal deviation by limiting the dissection to the area of deviation.[8]

In view of the advantages of endoscopic septoplasty highlighted in many recent studies, the present study has been taken up to assess advantages and disadvantages, if any, during endoscopic septoplasty and to compare post-operative results and complications of endoscopic with traditional septoplasty.

## **II. Materials and Methods**

A total of 50 (fifty) patients with symptomatic deviated nasal septum irrespective of sex, occupation, religion, race, socio-economic status and address, were prospectively studied at the Department of Otorhinolaryngology, Regional Institute of Medical Sciences Hospital, Imphal over a period of 18 months. The patients were divided into two groups. One group underwent endoscopic septoplasty and the other group will undergo traditional septoplasty under general anaesthesia. The first patient was assigned the surgery using lottery method. The next patient was allocated the other alternative surgery. In this manner, alternate patients were assigned. A detailed history was taken of all selected patients, using a pre-designed proforma. Then a thorough examination was undertaken and objective evaluation was performed by nasal endoscopy.

Karl Storz rigid endoscopes (0° and 30°) were used in endoscopic septoplasty under general anaesthesia. Xylocaine 2% with adrenaline infiltration (1:200000) was given on both sides just anterior to deviation. An incision caudal to deviation was given, submucoperichondrial and submucoperiosteal flaps were raised and deviations whether bony, cartilaginous or combination were identified. The septal cartilage was incised a few mm posterior to mucosal incision and caudal to deviation. Mucoperichondrial elevator was inserted to the cartilaginous incision and mucoperichondrial / mucoperiosteal flap on the opposite was raised. The deviated septal cartilage was excised using small Luc's/ Blakesley's nasal forceps. Any deviated portions of the vomer and perpendicular plate of ethmoid were removed if necessary.

For septal spurs an ipsilateral incision was given parallel to floor of nose on apex of spur. Flaps were elevated superiorly and inferiorly with an elevator to expose the underlying bony and cartilaginous spur. An osteotome was used against the base of spur to chisel out the bony protrusion and cartilaginous portion of spur was removed with help of small Luc's forceps. Flaps were repositioned and quilting suture used whenever possible.

Patients were followed upto three months post-operatively, and subjective assessment for nasal symptoms and objective assessment by nasal endoscopy were performed. Comparisons were made for relief of symptoms of nasal obstruction, headache, recurrent rhinorrhoea, hyposmia and post nasal drip after the surgery in both the groups under study and also post-operative complaints like haemorrhage, facial swelling, nasal pain and duration of hospital stay in both the study groups.

The data so collected were compiled and appropriate statistical tools were used to analyse the data. The probability value of  $P < 0.05$  was considered significant.

## **III. Inclusion Criteria**

The following subjects with OSA were included in the study: 1. Age above 15 years of age. 2. Septal deviation consistent with the presenting symptoms. 3. Symptoms lasting at least 3 months and persistent symptoms after a three months trial of medical management, including topical nasal steroids, topical or oral decongestants, or an oral antihistaminic decongestant combination.

#### **IV. Exclusion Criteria**

The following subjects with OSA were excluded from the study: 1. Sinonasal malignancy. 2. Acute infective sinonasal diseases. 3. Mucoceles protruding from sinuses into nasal cavity. 4. Radiation therapy to head and neck. 5. General medical condition that precludes elective surgery (including pregnancy).

#### **V. Results**

A total of 50 patients have been followed-up. Of these, 25 cases underwent endoscopic septoplasty and another 25 cases underwent traditional septoplasty. Total 50 patients consisted of 38 males (76%) and 12 females (24%). The male to female ratio for deviated nasal septum was 3:1. There were 21 (42%) patients in the age group of 16-25 yrs, 20 (40%) in 26-35 yrs, 6 (12%) in 36-45 yrs and 3 (6%) in 46-55 yrs. The youngest was 17 yrs and oldest 50 yrs. The most commonly affected subjects belonged to the 2nd and 3rd decade of life. The mean age was 28.00 yrs with a Std. Deviation  $\pm$  8.64.

Most common complaint in the patients of deviated nasal septum among study subjects was nasal obstruction (86%) followed by anterior nasal discharge (52%), headache (36%), post nasal drip (44%) and hyposmia (14%). (Fig. 1)

Postoperative follow up of the patients at 01 month showed that 90% cases that underwent endoscopic septoplasty (ES) and 82.60% of those who underwent traditional septoplasty (TS) were relieved of nasal obstruction while headache was relieved in 87.50% of ES Group and 60% of TS Group. Rhinorrhoea, postnasal drip and hyposmia were relieved in 75%, 80% and 66.66% of ES group respectively, while these were relieved in 85.71%, 75% and 50% of TS group. The differences of symptomatic relief in both groups were statistically not significant ( $p > 0.05$ ) (Fig. 2).

Postoperative follow up of the patients at 03 month showed that 90% cases that underwent endoscopic septoplasty (ES) and 82.60% of those who underwent traditional septoplasty (TS) were relieved of nasal obstruction while headache was relieved in 87.50% of ES Group and 60% of TS Group. Rhinorrhoea, postnasal drip and hyposmia were relieved in 75%, 80% and 66.66% of ES group respectively while these were relieved in 85.71%, 75% and 50% of TS group. The differences of symptomatic relief in both groups were statistically not significant ( $p > 0.05$ ) (Fig. 3)

Comparison of immediate complications after ES and TS (1 week): None of endoscopic group, and 2 (8%) patients of traditional group had nasal bleeding in immediate post-op ( $p > 0.05$ ), which was insignificant. 1 (4%) of endoscopic group and 3 (12%) of traditional group had nasal pain and facial swelling ( $P > 0.05$ ), which were insignificant. None of endoscopic group and 1 (4%) of traditional group developed septal perforation ( $p > 0.05$ ), which was insignificant. 2 (8%) of endoscopic group and 8 (32%) of traditional group had longer hospital stay ( $> 48$  hrs.) ( $P < 0.05$ ), which was significant. (Fig. 4)

Objective assessments on follow up examinations of the study subjects at 01 month and at 3 months post surgery revealed residual anterior deviation in 2 (11.11%) patients of endoscopic group, and in 2 (11.76%) patients of traditional group ( $p > 0.05$ ), which was insignificant. 1 (14.28%) of endoscopic group and 6 (75%) of traditional group had residual posterior deviation ( $P < 0.05$ ), which was significant. None of endoscopic group and 3 (33.33%) of traditional group had persistent spur ( $p < 0.05$ ), which was significant. None of endoscopic group and 5 (20%) of traditional group developed synechia ( $p < 0.05$ ), which was significant. (Fig. 5 and 6)

#### **VI. Discussion**

Numerous medical descriptions are available regarding the pathology and treatment of deviated nasal septum. Septoplasty is the surgery for correction of deviated nasal septum under local or general anaesthesia. It is a conservative surgery in which only the deviated part is removed leaving behind as much cartilage and bone as possible. It was first described by Cottle in 1947 as a treatment to correct nasal airway obstruction. [9] Lanza et al described endoscopic techniques to correct septal deformities. [10] Since that time surgeons have performed concomitant endoscopic septoplasties under varying situations not only to treat symptomatic nasal obstruction but also for improving surgical access to the middle meatus as an adjunct to ESS. [4, 11, 12, 13, 14] According to Brennan et al the ideal objective in septal surgery is permanent correction of deviation with avoidance of any complication. [15]

With the introduction of endoscopes in other branches of surgery, there have been attempts at its utilization in septal surgery. Endoscopic septoplasty is an attractive alternative to traditional headlight approach for septoplasty. Early reports of endoscopic septoplasty describe several advantages associated with the technique e.g. it makes easier for surgeons to see the tissue planes and it offers a better way to treat isolated septal spurs. Additionally, the endoscopic approach makes it possible for many people to simultaneously observe the procedure on a monitor, making the approach useful in a teaching hospital. The main disadvantages of endoscopic septoplasty are contamination of the endoscope with blood, which obscures the endoscope view.

Also, as one hand is required to hold the nasal endoscope, other instruments must be manipulated with a single hand, which can be difficult.[16]

The present study was conducted to evaluate the advantages and disadvantages of endoscopic septoplasty as compared to traditional septoplasty. In our study, there were 38 males (76%) and 12 females (24%). The male to female ratio for deviated nasal septum was 3:1. Total fifty patients consisted of 21(42%) 16-25 yrs, 20 (40%) 26-35 yrs, 6(12%) 36-45 yrs and 3 (6%) 46-55 yrs. The most commonly affected subjects belonged to the 2nd and 3rd decade of life. The mean age was 28 yrs. This was in concordance with the study of Rao et al.[17]

In our study, most common complaints of patients with septal deviations were nasal obstruction (86%), anterior nasal discharge(52%), headache(36%), postnasal drip(44%) and hyposmia(14%). The frequency of complaints of nasal obstruction (75%) and nasal discharge (55%) were similar to the study of Gupta and Motwani<sup>(32)</sup> and Bothra and Mathur<sup>(34)</sup>, but the headache was second major complaint in their study.[16,18]

Postoperative analysis at 01 month and at 03 months revealed that 90% cases that underwent endoscopic septoplasty (ES) and 82.60% of those who underwent traditional septoplasty (TS) were relieved of nasal obstruction while headache was relieved in 87.50 % of ES Group and 60% of TS Group. Rhinorrhoea, postnasal drip and hyposmia were relieved in 75%, 80% and 66.66% of ES group respectively, while these were relieved in 85.71%, 75% and 50% of TS group. In our study more number of patients were relieved from these symptoms in endoscopic septoplasty group as compared to conventional group but the differences of symptomatic relief in both groups were not statistically significant ( $p > 0.05$ ). This is in agreement with the observations of Gulati et al.[19] In a study by Sindwani and Wright, 54% patients with complaints of nasal obstruction and facial pain were cured and 38% showed improvement and 8% were not benefited.[20] Harley et al observed significant improvement in patients with nasal obstruction and headache in endoscopic group as compared to traditional group. [21] Significantly higher rate of persistence of symptoms were found with conventional septoplasty as compared to endoscopic septoplasty in the present study and that of Nayak et al.[22]

In our study, none of endoscopic group, and 2(8%) patients of traditional group had nasal bleeding in immediate post-op ( $p > 0.05$ ), which was insignificant. 1 (4%) of endoscopic group and 3 (12%) of traditional group had nasal pain and facial swelling ( $P > 0.05$ ), which were insignificant. None of endoscopic group and 1(4%) of traditional group developed septal perforation ( $p > 0.05$ ), which was insignificant. 2(8%) of endoscopic group and 8(32%) of traditional group had longer hospital stay ( $> 48$  hrs.) ( $P < 0.05$ ), which was significant. Castelnuovo et al and Hwang et al encountered no major post-operative complications, confirming our findings. [6, 8] In the study, most of the patients stayed in hospital for less than 48 hrs. More traditional septoplasty patients had longer durations of stay, compared with endoscopic septoplasty patients. Castelnuovo et al also reported a shorter recovery time after endoscopic septoplasty.[6]

In our study, objective post-operative evaluation at 01 and 03 months revealed residual anterior deviation was found to be present in 2 (11.11%) patients of endoscopic group, and in 2 (11.76%) patients of traditional group ( $p > 0.05$ ), which was not statistically significant. Residual posterior deviation was found in 1 (14.28%) of endoscopic group and 6 (75%) of traditional group ( $P < 0.05$ ), which was significant. Persistent spur was found in 3(33.33%) of traditional group and in none of endoscopic group ( $p < 0.05$ ), which was significant. Synechia was observed in 5(20%) of traditional septoplasty group and none of endoscopic septoplasty group ( $p < 0.05$ ), which was significant.

Park et al observed that the synechiae were formed in significantly less number in patients of endoscopic septoplasty group as compared to conventional group; similar results were found in the present study. [7] Nayak et al<sup>(29)</sup> found the post-operative incidence of persistent deviation and contact area to be significantly lower following endoscopic septoplasty compared with conventional septoplasty: similar results were found in our study.[23]

Overall, our findings showed better results and fewer complications for endoscopic septoplasty compared with traditional septoplasty.

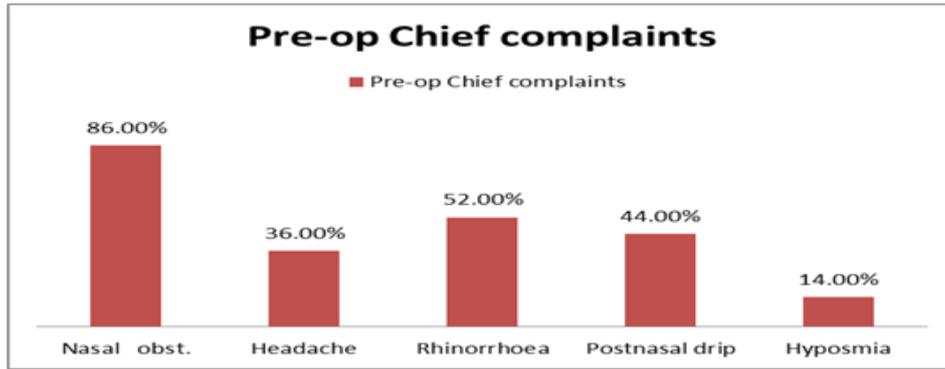


Figure 1: Chief complaints in preop

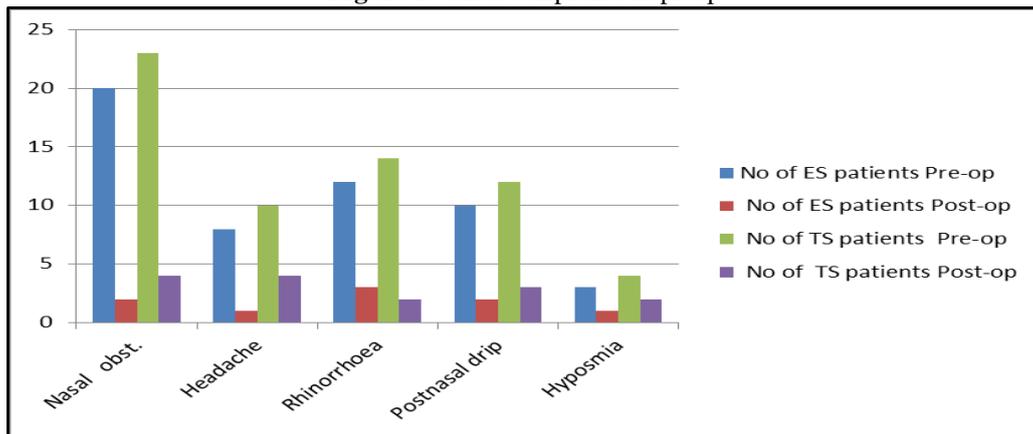


Figure 2: Comparison of relief in symptoms in both groups after 01 month

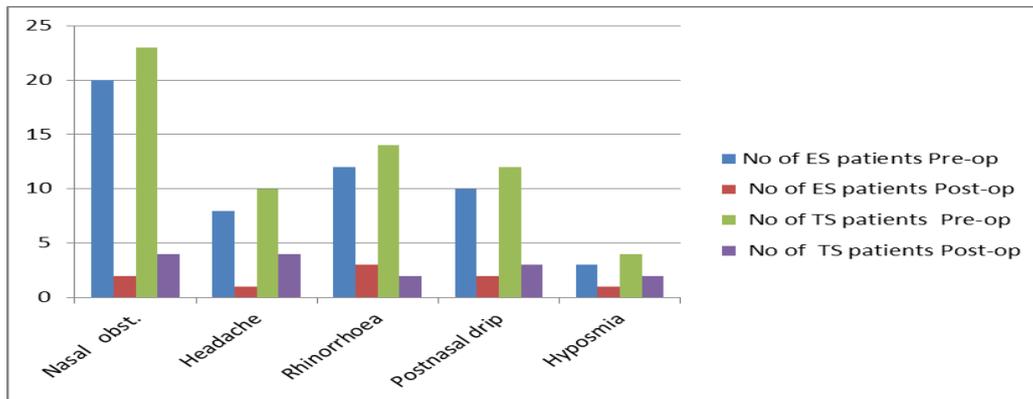


Figure 3: Comparison of relief in symptoms in both groups after 03 month

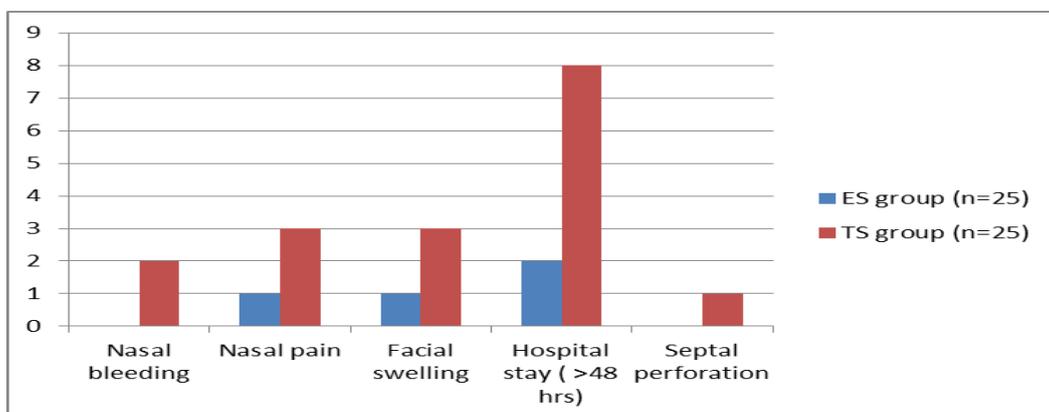
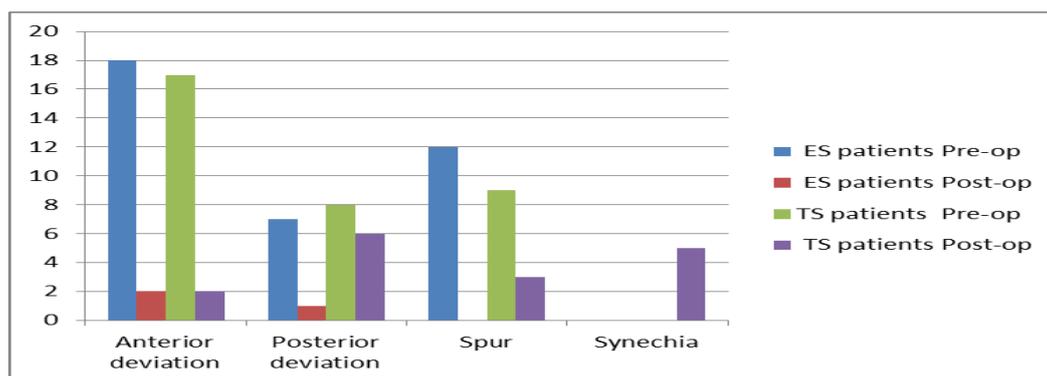
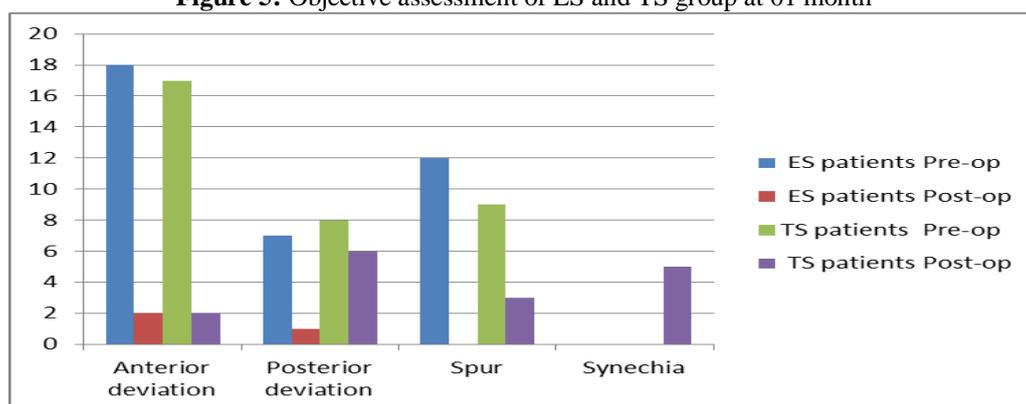


Figure 4: Comparison of immediate complications after ES and TS (1 week)



**Figure 5:** Objective assessment of ES and TS group at 01 month



**Figure 6:** Objective assessment of ES and TS group at 03 month

## VII. Conclusion

Our study showed better results and fewer complications in endoscopic septoplasty as compared to traditional septoplasty group as endoscope gives better illumination and access and allows limited incision, limited flap elevation and achieves correction of deviated septum with least resection. The endoscopic technique also causes fewer traumas to the septum, reducing the per-operative and post-operative complications. We concluded that endoscopic septoplasty is more safe and effective approach with a better patient compliance and shorter recovery time than the conventional method.

## References

- [1]. Gupta N. Endoscopic septoplasty. *Indian J Otolaryngol Head Neck Surg* 2005; 57(3):240-3.
- [2]. Chung BJ, Batra PS, Citardi MJ, Lanza DC. Endoscopic septoplasty: revisit of the technique, indications, and outcomes. *Am J Rhinol* 2007; 21:307-11.
- [3]. Stammberger H. *Functional endoscopic sinus surgery: The Messerklinger technique*. Philadelphia: Decker BC; 1991. 432-3.
- [4]. Lanza DC, Rosin DF, Kennedy DW. Endoscopic septal spur resection. *Am J Rhinol* 1993; 7:213-6.
- [5]. Durr DG. Endoscopic septoplasty: technique and outcomes. *J Otolaryngol* 2003;32:6
- [6]. Castelnovo P, Pagella F, Cerniglia M, Emanuelli E. Endoscopic limited septoplasty in combination with sinonasal surgery. *Facial Plast Surg* 1999; 15:303-7.
- [7]. Park DH, Kim TM, Han DG, Ahn KY. Endoscopic assisted correction of the deviated nose. *Aesthetic Plast Surg* 1998; 22(8):190-5.
- [8]. Hwang PH, McLaughlin RB, Lanza DC, Kennedy DW. Endoscopic septoplasty: indication, technique, and results. *Otolaryngol Head Neck Surg* 1999; 120(5):678-82.
- [9]. Maran AGD, Lund VJ: Trauma to nose and sinuses. In: 1st Edn; *Clinical rhinology*. New York: Thieme, 1990, pp. 110-139.
- [10]. Lanza DC, Kennedy DW, Zinreich SJ: Nasal endoscopic and its surgical applications. In: Lee KJ. *Essential Otolaryngology: head and neck surgery*. 5th Edn. Appleton & Lange, 1991; pp. 373-387.
- [11]. Giles WC, Gross CW, Abram AC, Greene WM, Avner TG: How I do it Head & Neck & Plastic surgery a targeted problem and its solution. *Endoscopic septoplasty. The Laryngoscope*, 1994; 104(12): 1507-1509.
- [12]. Cantrell H: Limited Septoplasty for endoscopic sinus surgery. *Otolaryngology, Head & Neck Surgery*, 1997; 116(2):274-277.
- [13]. Yanagisawa E, Joe J: Endoscopic septoplasty. *Ear Nose Throat Journal*, 1997; 76(9):622-623.
- [14]. Toffel PH: Septoplasty: It's place in modern management of chronic nasal and sinus obstructive disease. In: *Rhinologic and sinus disease: A problem oriented approach*. SD Schaefer Eds.; 1st Edn; Mosby St. Louis, 1998; pp. 55-60.
- [15]. Brennan HG, Parkes ML. Septal surgery: the high septal transfixion. *Int Surg* 1973; 58: 732-4.
- [16]. Bothra R, Mathur NN. Comparative evaluation of conventional versus endoscopic septoplasty for limited septal deviation and spur. *J Laryngol Otol* 2009; 123:737-41.
- [17]. Rao JJ, Kumar ECV, Babu KR, Chowdary VS, Singh J, Rangamani SV: Classification of nasal septal deviation- relation to sinonasal pathology. *Indian Journal of Otolaryngology & Head and Neck Surgery*, 2005; 57(3):199-201.
- [18]. Gupta M, Motwani G. Comparative study of endoscopic aided septoplasty and traditional septoplasty in posterior nasal deviations. *Indian J Otolaryngol Head Neck Surg* 2005; 57(4):309-11.

- [19]. Gulati SP, Raman W, Neetika A, Ajay G, Anju G. Comparative evaluation of endoscopic with conventional septoplasty. *Indian J Otolaryngol Head Neck Surg* 2009;61(1):27-9.
- [20]. Sindwani R, Wright ED. Role of endoscopic septoplasty in the treatment of atypical facial pain. *J Otolaryngol* 2003; 32: 77-80.
- [21]. Harley DH, Powitzky ES, Duncavage J. Clinical outcomes for the surgical treatment of sinonasal headache. *Otolaryngol Head Neck Surg* 2003; 129:217-21.
- [22]. Nayak D R, Balakrishnan R, Murthy KD, Hazarika P: Endoscopic Septo-turbinoplasty: Our update series. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 2002;54(1):20-24.
- [23]. Nayak DR, Balakrishnan R, Murty KD. An endoscopic approach to the deviated nasal septum: a preliminary study. *J Laryngol Otol* 1998; 112:934-9.