

**Outcome Analysis of Spreader Graft Vs Autospreader Flaps in Patients with Deviated Nose Undergoing Open Septorhinoplasty****Anandita Das****Associate Professor, Department of ENT, Guwahati Medical College, Guwahati, Assam****Received: 30-05-2023 / Revised: 30-06-2023 / Accepted: 30-07-2023****Corresponding author: Dr. Anandita Das****Conflict of interest: Nil****Abstract:**

**Introduction:** The spreader graft is a valuable tool in any rhinoplasty surgeon's armamentarium. There are innumerable studies, demonstrating its value in the restoration of nasal dorsal aesthetics, helping in the maintaining of patency of the internal nasal valve, and also maintaining the straightened position of the corrected dorsal cartilaginous septum in crooked noses. This study compares the insertion of spreader grafts vs auto spreader flaps in patients undergoing open septorhinoplasty.

**Objective:** To compare the efficacy of mid-vault reconstruction technique (spreader graft vs autospreader flap) in open septorhinoplasty cases done for crooked nose

**Design:** A prospective observational study of patients undergoing septorhinoplasty, whose mid vault was reconstructed using (1) spreader grafts, or (2) auto spreader flaps. Preoperative and postoperative results were evaluated using a detailed questionnaire and diagnostic nasal endoscopy.

**Results:** Ten patients completed preoperative and postoperative evaluation. No complications occurred in any of the patients. 7 patients were inserted with spreader grafts while only 3 patients were treated with autospreader flaps. In terms of aesthetic and functional outcomes in the first category, 5 and 6 patients were highly satisfied, 1 and nil was partially satisfied and 1 and 1 patients were not satisfied respectively. For the second category 1 and 2 patients were highly satisfied, nil and nil patients were partially satisfied and nil and 1 patients were not satisfied respectively

**Conclusions:** Midvault reconstruction using the spreader graft or auto spreader flaps helps prevent postoperative nasal obstruction. On comparing both these techniques it was seen that there was no significant difference in the aesthetic and functional outcome.

**Keywords:** Crooked Nose, Spreader Graft, Auto Spreader Flap, Septorhinoplasty.

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**Introduction**

The correction of the crooked or externally deviated nose is one of the most challenging surgeries in rhinoplasty both in terms of its cosmetic and functional outcome [1,2,3,4]. The external nasal deviation is associated with significant nasal septal deformity and asymmetries and deformities of the bony nasal vault [1]. These patients also have significant functional problems. Crooked nose is found in clinical practise today as result of road traffic accidents (RTA), physical violence or sports injury.[2] A trauma in childhood, may influence the later development of the nose causing deviation due to misdirection of growth centre.[16] Birth trauma during normal labour or forceps assisted delivery may cause deviated nose and septum. A genetic element also cannot be ruled out as in many families, it is seen that the child/children share similar nasal appearance with the parent. Spreader grafts was first proposed by Sheen in 1984 in which he reported 3 cases, where spreader grafts were used to increase the internal

nasal valve angle. [5] They are rectangular strips of cartilage placed submucosally along the dorsal edge of the septum that provides width to the dorsal roof and increases the internal valve angle by moving the lateral wall away from the septum.

These might be used either at one side (unilateral) or both sides (bilaterally). Spreader grafts are usually harvested from autologous cartilage (such as nasal septum, auricle and ribs) [6,7] or can be fashioned from the upper lateral cartilages themselves (autospreader flaps). They can be used to correct a range of deformities ranging from correction of an inverted "v" deformity, widening of the internal nasal valve to correction of the deviated cartilaginous vault.

The placement of the spreader graft and its attachment to the septum is a time consuming procedure even in open rhinoplasty technique and requires an inordinate amount of skill and dexterity in the Endonasal approach.[8] Autospreader flap is

a relative new technique where the dorsal part of the upper lateral cartilage is used as its own graft. [15] In the present study, we intend to compare the functional and aesthetic outcomes of these two techniques of rhinoplasty

### Method

10 patients who underwent open septorhinoplasty in Gauhati Medical College and Hospital & Swagat Hospital, Maligaon, from September '21 to September'22 were included in the study. All patients had both functional and cosmetic nasal deformities. An elaborate counselling session was done with each patients to ascertain their expectations from the surgery. They were then photographed in a frontal, basal, bilateral profile and three quarter view. After a detailed history was obtained, the patients were clinically evaluated and a diagnostic nasal endoscopy was done in all patients and pre-operative internal nasal valve angle was noted along with any other nasal deformities. The patients then underwent septorhinoplasty via the open approach for the correction of their nasal deformity.

Spreader grafts were used in all the cases to address the nasal deviation. Autologous spreader graft was placed in 7 patients and auto spreader flap was placed in rest of the 3 cases. The decision to use autologous spreader grafts were taken in those cases where adequate length of the spreader graft could not be harvested during septoplasty. There were 3 female patients and 7 male patients. Of these, 6 patients had prior history of trauma to the nose. The mean age was 31 years (ranged from 11 to 40 years).

All patients were followed up for a mean duration of 3 months. During this period, the patients were examined clinically, post-operative photographs were obtained, and diagnostic nasal endoscopy were performed. A satisfaction questionnaire was used (in two stages) before and three month after the surgery to assess the functional and aesthetic outcomes for the two techniques under comparison. Preoperative photographs were compared with the postoperative photographs to measure the degree of correction of the external nasal deformity.

### Surgical technique

All patients underwent open rhinoplasty procedure under general anaesthesia. After trimming the nasal vibrissae, the nose was adequately infiltrated and bilateral infra-cartilaginous incision was made and the skin and soft tissue envelop was lifted from the entire nasal dorsum by connecting the

infracartilaginous incision with a mid-columellar stair step incision. The dissection was carried out to the cartilaginous nasal dorsum in the supraperichondrial plane and once the keystone area was reached subperiosteal dissection was done. The caudal edge of the septum was then approached via the medial crurae and with a Cottle's elevator, the mucoperichondrial was elevated off the cartilaginous septum bilaterally. It was then detached from the maxillary crest. The upper lateral cartilages were then separated from the dorsal cartilaginous septum at its junction by sharp dissection using a knife. Any hump removal if needed was then done. Septal cartilage was then harvested leaving behind a 1 cm caudal and dorsal strut of the cartilaginous septum. The crooked dorsal septal cartilage was properly exposed to guide placement of the spreader graft.

After proper fixation of the septum at the anterior nasal spine and the keystone area wherever required, we placed the spreader graft fashioned from the harvested septal cartilage between the dorsal end of the septal cartilage and the upper lateral cartilage so as to straighten the cartilaginous dorsum. The grafts were 3 cm x 5 mm in size and the thickness varied from 0.8 mm to 1 mm. The grafts were placed from the cranial end of the cartilaginous dorsum to its anterior septal angle. The dorsal edge of the spreader graft ran immediately under the dorsum of the septal cartilage and did not protrude above it. We then used a 4-0 PDS suture to join the upper lateral cartilage to the spreader graft and the remaining nasal septum. In the 3 patients who received the autospreader flaps, the upper lateral cartilage was dissected from the underlying perichondrium, scored vertically and infolded to act as spreader grafts and attached to the dorsal septum as described before.

A percutaneous lateral osteotomy, median and intermediate osteotomy was then performed to correct any remaining deformities, wherever required and then tip work was completed. Skin and mucosa were sutured, and the nasal cavity was packed to maintain hemostasis.

### Results

Ten subjects were enrolled in the study. In the spreader graft category there were a total of 7 patients (5 males and 2 females) and 3 subjects (2 males and 1 female) in autospreader flap group. The age and sex distribution and etiology of the subjects in both the groups are detailed in table 1. None of the patients were revision cases.

**Table 1:**

Sl no	Age	Sex	Etiology	Type of graft	Osteotomy done	Source of graft
1	11	M	developmental	Spreader graft	Y	Septal
2	40	M	assault	Spreader graft	Y	Septal
3	19	M	RTA	Spreader flap	Y	-
4	19	M	assault	Spreader graft	Y	Conchal
5	21	F	RTA	Spreader graft	Y	Septal
6	19	F	RTA	Spreader graft	Y	Septal
7	36	M	developmental	Spreader flap	Y	-
8	15	M	developmental	Spreader graft	Y	Septal,
9	29	M	RTA	Spreader graft	Y	Conchal
10	32	F	developmental	Spreader flap	Y	-

Clinical photographs, clinical examination, and diagnostic nasal endoscopy were performed for all subjects before and after the surgery. All subjects in both groups had complaints of nasal obstruction with external nasal deviation. Mild, moderate and severe grade of septal deviation were noticed in 2, 2 and 3 subjects of spreader graft group and 2 and 1 subjects of autospreader flap group, respectively and this was consistent with the amount of anterior septal deviation. 3 of these patients had significant nasal mucosal oedema.

These patients were treated with intranasal corticosteroid nasal spray for duration of 3 weeks. None of the patients in the autospreader flap group

had severely deviated nose. The modified Cottle's test was positive in 4 subjects of spreader graft group and 3 subjects of the autospreader flap group. Septorhinoplasty was conducted for all the patients using open technique.

In terms of aesthetic outcome, post operatively 6 subjects (60%) reported complete satisfaction, 3 (30%) reported partial satisfaction and 1 subject (10%) was unsatisfied. With regards to the functional outcomes, 8 patients (80%) were completely satisfied with their functional outcome and only 2 patients (20%) was dissatisfied with their functional outcome. This is presented in table 2.

**Table 2: The patient's satisfaction presented by graft type in both groups**

		Spreader. Graft	Auto-spreader flap
Aesthetic satisfaction	Highly satisfied	5	1
	Partially satisfied	1	2
	Not satisfied	1	0
Functional satisfaction	Highly satisfied	6	2
	Partially satisfied	0	0
	Not satisfied	1	1

## Discussion

The crooked nose poses a particular challenge to surgeons because these patients have both functional and aesthetic problems. Septorhinoplasty concurrently restores the nasal aesthetics and also corrects the nasal airway functionally. Currently, the use of spreader grafts provides the most favorable results in the patients with deviated or crooked nose undergoing rhinoplasty.

In terms of assessing the functional aspect, the traditional method of anterior rhinoscopy, Cottle's test and performing the diagnostic nasal endoscopy is most relied upon. But due to intra and interobserver variability, CT scans along with DNE have been proposed as the optimal method for measuring the internal nasal valve angle. However, conventional tomographic scans cannot be performed at the optimal angle, therefore, cannot be used to evaluate the nasal valve reliably.[16] Although there have been previous studies which have evaluated the nasal valve area and the nasal

valve angle with coronal CT images, but in many of these studies CT and magnetic resonance imaging have been performed to validate other objective test results, not to aid in clinical decision making. [17,18]

The placement of spreader grafts, is a complex surgical technique. This technique was first introduced by Jack Sheen in the mid-1980s, who proposed using spreader grafts to reconstruct the middle cartilaginous nasal dorsum for an inverted 'v' deformity. Presently the scope of spreader grafts in rhinoplasty has expanded considerably.

Spreader grafts are fashioned from the harvested nasal septal cartilage, auricular cartilage or rib cartilage [7]. The first choice for harvesting the cartilage for spreader grafts is always the nasal septum but in certain cases where the septal cartilage is not firm enough, doesn't have an adequate length or in revision cases, the auricular or rib cartilage is also a good choice.

Spreader grafts can be placed either endonasally or by external rhinoplasty approaches.

Studies from Jang and Sinha (2007)[9], Oliveira et al[10] and Giacomini et al. (2010)[11] successfully reported results of septorhinoplasty using spreader graft in 33, 6 and 15 cases respectively. Although spreader grafts can successfully address a host of deformities, there are some limitations for its use. The spreader grafts if not inserted in the correct location may instead contribute to nasal obstruction and this can lead to a decrease in the functional outcome.[12] It also tends to increase the width of the nasal dorsum. Moreover, it is also a technically challenging and time consuming surgical step.

Autospreader flap is an alternative technique that uses the medial portion of the upper lateral cartilages adjacent to the dorsal septum in an infolding technique without increasing the width of the nasal dorsum. Autospreader flap technique is very useful in cases where there is an excess length of upper lateral cartilages after hump reduction or when we want to narrow the cartilaginous nasal dorsum but at the same time also increase the internal nasal valve angle.[13,14]

The autospreader flap was first customized by Baker, wherein the dorsal aspects of the upper lateral cartilage was infolded by partially scoring it, and then sutured to the nasal septum.[15] Hussein et al. reported that autospreader flap was an effective spreader graft alternative. They described a technique of suturing whereby the spreader flap obtains a spring action thereby contributing to the increase in the nasal valve angle too.[16]

### Conclusion

We can conclude that both spreader graft and autospreader flap techniques can be used in the restoration of nasal dorsal aesthetics, helping in the maintaining of patency of the internal nasal valve, and also maintaining the straightened position of the corrected dorsal cartilaginous septum in crooked noses.

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