

## Outcome of nose deviation correction with spreader graft and L-strut graft

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**Abstract: Introduction:** A deviated nose is the one which its vertical axis is different from the vertical axis of the face. The correction of this deformity is challenging subject due to functional (airway obstruction) and cosmetic problems. There are some different techniques for correction of the deviation. Spreader grafts and L-Strut grafts are two most useful techniques. The aim of this study is to compare the correction of the septal deviation in two spreader and L-Strut grafts techniques. **Methods:** In a clinical trial in Tabriz Imam Reza hospital in years 2009 to 2011, 50 patients with nasal septum deviation candidate for rhinoplasty in two equal groups. The patients were enrolled into one of groups randomly after achieving the inclusion criteria and if the exclusion criteria did not meet them. The Spreader graft technique was used for one group and the L-Strut graft was used for other, the results of surgery was recorded before and 6 months after operation and was analyzed and compared in each group and between the two groups. **Results:** From patients, 33 (66%) were male and 17 (34%) were female. The minimum age of patients was 18 years and the maximum age was 30 years with a mean age to  $23.50 \pm 2.77$  years. The results of surgery in cases of severe and moderate nose deviation had significant difference between two group and the excellent and good results were more in the L-Strut group ( $P=0.01$  and  $P=0.04$  respectively). In the cases of mild septal deviation, difference between two surgical method was not statistically meaningful ( $P=0.15$ ). **Conclusion:** Surgical correction of the deviated nose is one of the most difficult levels in rhinoplasty. Two most used techniques are spreader and L-strut grafts. Regarding to the findings of present study, L-strut grafts especially in cases of severe and moderate nose deviations has more desirable results comparing spreader grafts.

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### 1. Introduction

In the nasal deviation, the vertical axis of the nose is different from the vertical axis of the face. Due to the functional difficulties (airway obstruction) and aesthetic problems, correction of this deformity is often a challenging issue (Patterson, 1981; Byrd and Salomon, 1998; Gilbert, 1998; Guyuron and Behmand, 2003). The anatomical basis of deviations may be associated with abnormal bony pyramid, septal deformity, or a combination of the two, cause of which may be congenital or acquired, secondary to trauma or surgery (Gunter and Rohrich, 1998).

Septum cartilage deviation modification techniques include liberating the septal cartilage between the upper and lower lateral cartilages (Gunter and Rohrich, 1998; Song, 2008; Gubisch, 2006). After correcting Skeletonization of septal cartilage, its central part is removed and an L-strut is left. Then, the caudal and dorsal deviation line of the L-strut is modified by a variety of techniques, including septal batten graft, spreader graft, scoring sectioning, and sectioning and overlap suture techniques (Song, 2008; Porter and Toriumi, 2002). Placement of the spreader graft requires an appropriate, long and wide piece of the septal cartilage. However, there is often a little cartilage removable for spreader graft. Obviously, aesthetic

and reconstructive rhinoplasty has been accepted as the most difficult and yet the most delicate plastic surgery in the world and reached a modern development over the years.

A more complete understanding of the long-term surgical outcomes and paying attention to them is considered as a guide for the selection of proper surgical technique; as the surgeons are not willing to put the patient at the risk of future functional and aesthetic complications for achieving short-term satisfactory results in return.

External nasal deviation is also one of the most challenging aesthetic issues in rhinoplasty, which in addition to its aesthetic deformity, may cause nasal obstruction and hinder easy breathing through the nose and it is irritating for most patients and for some patients, its importance even goes beyond aesthetic aspect (Song, 2008). Furthermore, most surgeons are seeking a secure technique in order to solve the patient's problem in both aesthetic and functional aspects. Several techniques have been applied to obtain better results in modification of external nasal deviation. Spreader graft approach, L-strut technique, suture and L-strut graft have been most applied; however, no complete results have been achieved in any of these techniques in either aspects of aesthetical or functionality. In a percentage of the

patients, external nasal deviation, and aerial tract obstruction accordingly, still remain to some extent (Porter and Toriumi, 2002); and yet there is no study among the presented studies comparing the effectiveness of these techniques in correction of external nasal deviation.

Therefore, in this study examining the results of the 6-month follow-up of surgical modification of nasal septum deviation by one of the two methods of spreader graft and L-strut graft, we are intended to determine the technique leading to better and more modification of external nasal deviation; and so, contribute to betterment of surgical modification techniques of external nasal deviation.

## 2. Material and Methods

In a clinical trial in Department of Ear, Nose & Throat, Tabriz University of Medical Sciences, on 50 patients with external nasal deviation candidate for rhinoplasty surgery, 40 cases were selected according to the inclusion criteria and randomized into two groups and underwent rhinoplasty with spreader graft and L-strut graft techniques and evaluated the surgical outcomes of patients during month after surgery.

### Procedure:

All referring patients who met the inclusion criteria (with external nasal deviation requiring rhinoplasty) were examined during the study period in two groups (each with one of the two techniques of spreader graft and L-strut graft). In this study, randomized sampling was applied.

Evaluation of deviation intensity in patients (mild, moderate and severe groups) was performed by a surgeon and the cases underwent surgery with open rhinoplasty approach by one of the two techniques randomly.

Postoperative cares taken in all patients in both groups were identical. Photos of appearance of noses of all patients were taken preoperatively and 6 months after surgery in order to evaluate the quality of the surgery. The outcome obtained after surgery was evaluated as no change, average, good or excellent and recorded in the evaluation form. During 6 months after surgery, patients were evaluated in terms of the rate of correction of the deviation between the two groups and the findings were compared by another surgeon blind to the techniques used. Entire patient data collected in pre-configured forms and were statistically analyzed in the final stage. Patients with history of systemic disease (tuberculosis, granulomatous disease such as sarcoidosis, Wegener and etc.), history of previous Septoplasty surgery, history of previous rhinoplasty,

and saddle-shaped nose with nasal septum deviation were excluded.

### Statistical Analysis:

Data obtained was analyzed using SPSS™ statistical software, Version 16, and the results were reported as Mean  $\pm$  SD, and also frequency and percentage. RMA test was used to compare the quantitative variables and Chi-square test to compare the qualitative variables, and when necessary, Fisher's exact test was used in both groups and  $P < 0.05$  was considered as significant.

## 3. Results

33 patients (66%) were male and 17 (34%) were female. The mean age of the patients was  $23.50 \pm 2.77$  years and in the range of 18-30 years.

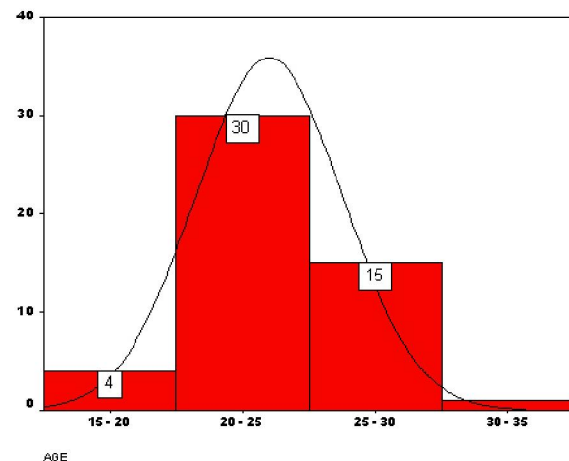


Chart 1. Age distribution of patients

### Outcome of surgery in patients with severe nasal septum deviation:

In the L-Strut technique group, 11 patients (44%) had severe nasal deviation, that after surgery, the outcome of surgery was excellent in 10 patients (90.9%) and good in 1 patient (9.1%).

In the Spreader technique group, 11 patients (44%) had severe nasal deviation, that after surgery, the outcome of surgery was excellent in 3 cases (27.3%), good in 3 cases (27.3%) and average in 5 cases (45.5%).

Outcome after surgery in patients with severe deviation in L-Strut technique group was significantly better than in the Spreader technique group ( $P=0.01$ ).

### Outcome of surgery in patients with a moderate deviation of the nasal septum:

In the L-Strut technique group, 8 patients (44%) had moderate nasal deviation, that after surgery, the outcome of surgery was excellent in all cases (100%). In the Spreader technique group, 8 patients (32%)

had moderate nasal deviation, that after surgery, the outcome of surgery was excellent in 4 cases (50%), good in 3 cases (37.5%) and average in 1 case (12.5%).

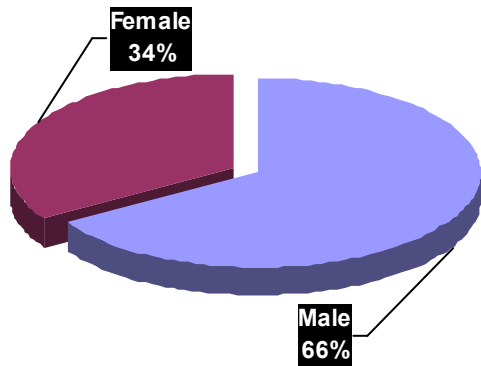


Chart 2. Frequency of patient's gender

Outcome of surgery in patients with moderate deviation in L-Strut technique group was significantly better than in the Spreader technique group ( $P=0.04$ ).

#### **Outcome of surgery in patients with mild nasal septum deviation**

In the L-Strut technique group, 6 patients (24%) had mild nasal deviation, that after surgery, the outcome of surgery was excellent in all cases (100%). In the Spreader technique group, 6 patients (24%) had mild nasal deviation, that after surgery, the outcome of surgery was excellent in 4 cases (66.7%) and good in 2 cases (33.3%).

There was no significant difference between the surgical outcomes in patients with mild deviation with the two techniques of L-Strut and Spreader ( $P=0.15$ ).

Out of 25 patients who underwent surgery with L-Strut graft technique, the outcome of surgery was excellent in 24 cases (96%) and good in 1 case (4%). As well, out of 25 patients who underwent surgery with Spreader graft technique, the outcome of surgery was excellent in 11 cases (44%), good in 8 cases (32%) and average in 6 cases (24%) that the results obtained in L-Strut graft technique group was significantly better than the results obtained in Spreader Graft technique group ( $P=0.001$ ).

#### **4. Discussions**

Surgical correction of deviated nose is one of the most important steps and perhaps the most difficult one in rhinoplasty. The current deviations may be very complex, so that strategies may need to be unique in every case (Song, 2008). Correcting the posterior deviation and maintaining this correction is

a key factor in nasal deviation modification. Several techniques, such as tenderizing the septum to align the septum pieces, are applied for this purpose (Gubisch, 2006).

In this study, correction rate of nasal deviation has been compared by two techniques of L-strut graft and spreader graft that among 50 patients under study, 33 cases (66%) were male and 17 cases (34%) were female. Minimum age of the patients was 18 years and maximum age was 30 years, and mean age was  $23.5 \pm 2.77$  years. Of 50 patients studied in both groups, 11 cases (44%) had severe and 8 cases had moderate nasal deviation. Postoperative quality of modification of nasal septum deviation in L-Strut method in patients with severe ( $p=0.01$ ) and moderate ( $p=0.04$ ) deviation was significantly better than in Spreader graft method.

General outcome of surgery in the group undergoing surgery using L-Strut graft was excellent in 96% and good in 4% of the cases. These results are completely concordant with the study of Song et al reporting the success rate of 81.5% using L-Strut graft (Song, 2008). In a study by Jang et al on 23 patients with apparent nasal deviation and the septum deviation using L-strut graft method, they reported the outcome of surgery as excellent in 56%, good in 22% and average in 22% (Jang, 2009). The results of our study indicate excellent outcome in 96% of the cases which is far better than these studies.

Metzinger in his study stated that using L-strut graft in modification of apparent nasal deviation had good outcomes without losing the natural shape of the nose, airway obstruction and morbidity after one year (Metzinger, 1994). These results also indicate absolute concordance with those of our study. As well, the results of the current study are comparable with the study by Faris where L-Strut technique was applied for modification of nasal deviation and obstruction, and excellent outcomes in this field (Faris, 2006).

Surgical correction of deviated nose is considered as one of the most difficult steps in rhinoplasty. Spreader graft and L-Strut graft are among the most widely used of these techniques. According to the results obtained from this study, the use of L-Strut graft, especially in cases with severe and moderate septal deviations had given better outcomes than Spreader graft.

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