Spreader Graft In Septo - Rhinoplasty

Yong Ju Jang · Vikas Sinha

Abstract

Background The aim of study was to evaluate the effects of spreader graft in septorhinoplasty.

Materials and Methods The study group comprised of 33 patients of various nasal deformities who underwent consecutive septorhinoplasty at Asan Medical Center, University of Ulsan, College of Medicine, Republic of Korea (South Korea). All the patients had undergone open rhinoplasty procedure. The submucous resection of septum was done, leaving 1 to 1.5 cm. of septal cartilage for dorsal and caudal support. The spreader graft was harvested from septal cartilage in 31 cases and costal cartilage in 2 cases. All the patients had undergone endonasal high to low to high osteotomy, paramedian osteotomy and percutaneous transverse osteotomy. The periosteum was not elevated in any case. The spreader graft was placed and secured with septal cartilage and upper lateral cartilage with suture material. Crushed small pieces of septal cartilage were used for dorsal augmentation. The tutuplast fascia lata was used to camouflage the dorsal irregularity.

Conclusion All the cases had good aesthetically dorsal line, opening of internal nasal valve area and good septal support, which was weakened by the removal of deviated septum.

Keywords Spreader graft · Osteotomy · Septal cartilage · Upper lateral cartilage

Introduction

The spreader graft act as a spacer between the upper lateral cartilage and septum. It is indicated to maintain or reconstruct the dorsal nasal roof, to maintain or reconstruct the internal nasal valve, to straighten high dorsally deviated septum and to recreate dorsal aesthetic line¹. It can be placed endonasally or by external rhinoplasty approach. The endonasal placement of spreader graft is technically difficult but in open rhinoplasty procedure this procedure is relatively easy. It can be harvested from cartilaginous part of nasal septum during the correction of deviated nasal septum surgery. If it is not adequate in size it can be harvested either from the conchal cartilage or costal cartilage. The septal cartilage is easiest to obtain but not necessarily it is adequate in length wise to be used as spreader graft especially in case of revision rhinoplasty. The conchal cartilage is preferred method of reconstruction but it differs in anatomic shape from the nasal septum and tends to return to its initial appearance due to cartilaginous memory and often it is too short. The costal cartilage provides sufficient length but has its disadvantage of additional incision, prominent scar and the postoperative pain. Many ENT surgeons are not comfortable in taking costal cartilage graft for the fear of pneumothorax.

Patients and methods

A retrospective study was done in subspecialty Rhinology in the department of Otorhinolaryngology, at Asan Medical Center, Seoul, Republic of Korea (South Korea). Total 33 consecutive patients who had undergone septorhinoplasty in last 3 months were considered for this study. The spreader graft was used in all 33 patients. Their record was taken out for this study to know the type and indication for using spreader graft. All the spreader grafts were placed by the open rhinoplasty procedure and was done by the same surgeon. There were 27 male patients and 6 female patients and the mean age was 33 years, the minimum age was 16 years of female patient and maximum age was 49 years of male

Yong Ju Jang (✉)
Associate Prof. ENT
Department of Otorhinolaryngology
Asan Medical Center,
University of Ulsan College of Medicine,
Seoul, Republic of Korea (South Korea)
E mail jangyj@amc.seoul.kr

Vikas Sinha
Asan Medical Center,
Seoul, Republic of Korea (South Korea)
And Prof. and Head ENT. B.J. Medical College (Civil Hospital)
Ahmedabad (Gujarat), India

Fig. 1 Pre operative findings in the cases, N=33

Fig. 2 Suturing of spreader graft with septal cartilage and upper lateral cartilage

patient. All the patients had deviated nose (100%), hump in 9 patients (27%), pseudo hump in 1 case (3%) under projected nose 2 patients (6%), saddle nose 1 case (3%) (Fig. 1). There was one case of revision rhinoplasty.

Open rhinoplasty procedure was adopted in all the cases. All the patients had undergone lateral, medial and percutaneous transverse osteotomy. All the cases required spreader graft to strengthen the dorsal portion of septal cartilage which became weak after doing necessary correction of septal deviation. This procedure also opened up the internal nasal valve area as all the patients had primary complaints of nasal obstruction. It also provided good dorsal aesthetic line.

Operative procedure

All the patients had undergone open rhinoplasty procedure under general anesthesia. After making inverted V incision at narrowest part of the columella, the skin flap was elevated. The anterior septal angle was identified and both sides mucoperichondrium flap was elevated and submucous resection of the septum is performed. The purpose of this step is to correct the septal deviation, free the cartilaginous septum from its attachment that might interfere with reduction of nose and provide the material for the grafting. The cartilaginous septum was separated from the ethmoid bone posteriorly and vomer bone inferiorly. The septal cartilage was harvested while leaving 1 to 1.5 cm. cartilage intact for dorsal and caudal support. It is also important to preserve the attachment of the cartilaginous septum at the keystone area to avoid loss of septal support. The upper lateral cartilages were sharply detached from the cartilaginous septum just flushing with the septum. The osteotomies were performed. The bilateral medial osteotomy was performed first, then bilateral endonasal osteotomy and finally percutaneous transverse osteotomy.

The medial osteotomy was 15 to 25 degree para median osteotomy taking care not to damage the key stone area. The lateral osteotomy was high to low to high by 4 mm curved guarded osteotome by endonasal approach after making

incision at pyriform fossa above the attachment of inferior turbinate. The periosteum was not elevated in any case. The high setal osteotomy² was not done in any case rather percutaneous transverse osteotomy was done at radix area for the radix deviation after giving stab incision at the skin by 2 mm. sharp osteotome, just lateral to mid line of radix area. The incomplete osteotomies were avoided since it predispose to residual deviation. The medial force was applied digitally and in all the cases bony wall shifted without tendency for memory or drift.

The length of upper lateral cartilage was measured by the scale and the removed septal cartilage was cut into long strips as per requirement of the case. If elevation of the tip was required, the septal cartilage was cut more than length of upper lateral cartilage and if tip elevation was not required, it was cut into the same size as upper lateral cartilage. It is stitched with septal cartilage by using 5-0 chromic catgut and PDS suture material at two to three places. Once this spreader graft is secured with septal cartilage, this whole assembly is sutured two to three places with 5-0 PDS with upper lateral cartilage (Fig. 1) thus securing the whole assembly of spreader graft and septal cartilage with upper lateral cartilage. To camouflage the dorsal irregularity, the tutuplast fascia lata was placed on the dorsum part in two to three layers. The remaining part of cartilage was cut into the small pieces, made thin by the cartilage crusher and kept under the facia lata for the dorsal augmentation. The final shaping and draping of dorsum is done with fingers and skin incision was closed with 6-0 nylon.

Discussion

In cases of revision rhinoplasty, septal cartilage is usually not adequate. In such situations either conchal cartilage or costal rib cartilage can be used. The autologas costal cartilage was used in 2 cases only (6%). One was revision rhinoplasty case where there was no septal cartilage available for the spreader graft, while the other case had marked saddling of the nose and the septal cartilage was not adequate for the augmentation and additional cartilage required to augment

Fig 2 Pre operative photograph and post operative photograph with spreader graft

- a) Pre operative photo
b) Post operative (one year after surgery)

the dorsal area of nose. Bilateral single layer of spreader graft was used in on both sides in 30 cases (90%). The unilateral spreader graft was required only in 1 case (3%) to overcome the concave deformity on one side. Two cases (6%) required two slices of spreader graft on one side to overcome the concave deformity. The spreader graft lateralizes the upper lateral cartilage thus opens the internal nasal valve area. The spreader graft also brings the symmetry on the both sides of the dorsum and if viewed from above, the dorsal septum and spreader graft should be in exact aesthetic midline. The use of conchal cartilage was avoided as Koreans have very thin conchal cartilage, which may be unsuitable for the spreader graft. The autologous bone especially perpendicular plate of ethmoid was avoided for its thinness and difficulty in suturing with the septal cartilage. The bone has also high chances of resorption.

Pontius and William³ used spreader graft endonasally by creating a snug pocket for the spreader graft at the osseocartilaginous junction but the critical factor for the success of the operation rest with maintaining the connection between the upper lateral cartilage and the dorsal segment. The spreader graft fits into the angle between the upper lateral cartilage and the septum and exerts a cantilever effect. However all our cases went open rhinoplasty approach and placement of spreader graft was always easy approach as compared to endonasal method. Moreover open approach also gave better judgment on the operation table and better option of placing unilateral or bilateral spreader graft or one layer or two layers of spreader graft as unilateral spreader graft was placed in one case and two layers of spreader graft on one side and one layer on one side on 2 cases.

PDS (polydioxanone) is suture material, which takes about 3 months to dissolve thus providing stability for spreader graft for the longer period of time.

Gurlek et al¹. used high density porous polyethylene (HDPP), a non resorbable synthetic material for the nasal spreader graft in 15 patients and during the mean follow-up period of 16 months, there was no complication nor any recurrence of airway obstruction was noted. However they cautioned that HDPP being a foreign material is associated with some complications like infection and extrusion but this risk can be reduced by sterilization and use of antibiotics.

Acarturk and Gencel⁴ used spreader graft successfully for severe open roof deformity, middle vault collapse and over resection of Osseo cartilaginous hump along with severe respiratory problem.

Conclusion

The spreader graft provides good aesthetically dorsal line, opens up the internal nasal valve area, and provides good dorsal support to the septum weakened by resection of septum for the correction of deviated nasal septum.

References

1. Gurlek A, Celik M, Fariz A, Ersoz-Ozturk A, Eren AT, Tenekeci G. The use of high-density porous polyethylene as a custom-made nasal spreader graft. *Aesthetic Plastic Surgery*; 2006, 30:34-41
2. Jameson JJ, Perry AD, Ritter EF. High septal osteotomy in rhinoplasty for the deviated nose. *Annals of plastic surgery*; 2006, 56(1): 40-45
3. Pontius A, William EF. Endonasal placement of spreader grafts in rhinoplasty. *ENT-Ear, Nose & Throat Journal*; 2005. (3): 135-136
4. Acarturk S, Gencel E. The spreader-splay graft combination: A treatment approach for the osseocartilaginous vault deformities following rhinoplasty; *Aesthetic Plastic surgery*; 2003, 27: 275-280