



# The hammer graft: A novel technique to provide dorsal support, tip projection, and rotation in rhinoplasty

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## ABSTRACT

**Background:** There are numerous cartilaginous grafts that can be used in rhinoplasty, depending on the specific needs of the patient. These include spreader grafts, dorsal onlay, tip grafts, septal extension, and columellar struts grafts, among others.

**Objective:** The aim of this study is to demonstrate use of the hammer graft in rhinoplasty; this technique can be used to improve dorsal support, tip projection, and tip rotation using a single cartilage graft.

**Materials and methods:** This novel graft was applied in 18 patients who underwent rhinoplasty. In revision patients, hammer graft was harvested from costal cartilage and in primary cases from septum cartilage. They were followed in average 12 months (between 6 and 18 months).

**Result:** Three of these patients were revision cases and 15 were primary cases. In revision patients, hammer graft was harvested from costal cartilage and in primary cases from septal cartilage. The targeted results were achieved to a large extent in all patients. All patients had satisfactory esthetic results.

**Conclusion:** The hammer graft as a single and stable graft useful support for the dorsal part, caudal part and extension part of the septum to be used in primary and revision rhinoplasty.

## 1. Introduction

The nasal tip projection consists of the length and strength of lower lateral cartilages, the suspensory ligament, fibrous connections to the upper lateral cartilages, and the anterior septal angle [1]. Several cartilage grafts have been described to alter nasal tip projection and rotation. Columellar struts and septal extension grafts are both commonly used in modern rhinoplasty to adjust nasal tip projection and rotation [2].

The use of septal extension grafts is particularly beneficial for patients with a weak or under-projected nasal tip, which can be caused by a variety of factors including genetics, trauma, aging, or previous nasal surgery. By extending the septum and providing support to the nasal tip, a septal extension graft can create a more defined and aesthetically pleasing nasal tip [3]. In addition to enhancing the appearance of the nose, septal extension grafts can also help to improve nasal breathing. The graft provides support to the nasal tip, which can help to prevent collapse of the nostrils during inhalation and improve airflow through the nasal passages.

The use of spreader grafts is particularly beneficial for patients with a deviated septum, narrow nasal passages, or a depressed mid-nasal vault. By widening the dorsal nasal septum, a spreader graft can help to improve nasal breathing and create a more aesthetically pleasing nose [2,3].

The aim of this study was to demonstrate the use of the hammer graft, which is a cartilaginous graft that provides nasal tip projection and rotation, supports the caudal part of the septum, as well as nasal dorsal stabilization in one piece, in rhinoplasty cases.

## 2. Material and method

This study consisted of retrospective chart reviews of existing medical records and therefore did not require IRB approval. No identifiable patient data was reported, and consent was not required.

Revision or primary rhinoplasty patients who were planned to be placed with a spreader graft for nasal dorsum stabilization and whose nasal tip projection and rotation were aimed to be increased by supporting caudal part of the septum and application of columellar strut

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Fig. 1. Hammer

graft were included in the study. Instead of three separate grafts, the hammer graft is one solid piece and consists of three parts: dorsal part, caudal part and extension part. The hammer graft, designed as a hammer, was formed from septal cartilage in primary cases and costal cartilage in revision cases. For hammer graft prepared from septal cartilage, number 15 scalpel is used, while using a piezo device for hammer graft prepared from costal cartilage is a very useful and good option.

### 2.1. Technique

In this study, open rhinoplasty approach was applied to all patients under general anesthesia due to the severity of the cases. Traditional transcolumellar and bilateral infracartilaginous incisions were made

and the skin and soft tissue coverage was elevated at the supra-perichondrial and subperiosteal levels over the cartilaginous and bony skeletons, respectively.

For revision patients, hammer graft was formed from costal cartilage and in primary cases from septal cartilage. The costal grafts were harvested at the beginning of the operation. Cartilage grafts were usually obtained from the right sixth or seventh ribs. After peeling the perichondrium, the costal cartilage graft was taken in the desired size with a piezo device and hemostasis was achieved. In cases where costal cartilage graft was used, a hammer graft was created using the oblique split method in order to avoid warping and to have a strong stable graft [4].

The graft was designed as a hammer from the costal cartilage with a Piezo device in revision cases and from the septal cartilage with a scalpel in primary cases. Hammer graft provides the effect of columellar strut,

spreader graft and septal extension graft in one piece (Fig. 1) (Video 1).

Tip plasty was made after nasal tip projection and rotation were reconstructed as desired with nasal dorsal stabilization with the help of hammer graft. Incisions were closed with 5-0 pds sutures. Finally, an intranasal silicone septal splints and external splint were placed. The intranasal splint and external splints were removed on 7th day after surgery.

### 3. Result

Hammer grafts were applied to a total of 18 patients, 8 men and 10 women, aged between 17 and 39. It was used for crooked nose correction and tip projection in 11 patients, and L strut strengthening and projection enhancement in 7 patients. Three of these patients were revision cases and 15 were primary cases. In revision patients, hammer graft was formed from costal cartilage and in primary cases from septum cartilage. Desired results were achieved to a large extent by providing the targeted tip point and the support of the dorsal part, caudal part and extension part of the septum in all patients. They were followed in average 12 months (between 6 and 18 months). All patients were judged by the author to have satisfactory esthetic outcomes.

### 4. Discussion

In this study, we have demonstrated the use of the hammer graft in rhinoplasty cases. Hammer graft is a hammer designed graft that shows the effect of columellar strut, spreader graft and septal extension graft in one piece.

There are several types of cartilaginous grafts that can be used in rhinoplasty, depending on the specific needs of the patient. These include spreader grafts, dorsal onlay grafts, tip grafts, septal extension grafts, and columellar struts, among others. Each of these grafts serves a specific purpose in rhinoplasty and can be used to improve the structure, function, and aesthetics of the nose. The choice of graft and the required surgical technique used will depend on the individual patient's anatomy and desired outcome, as well as the surgeon's experience and training.

Different types of columellar strut have been described according to the degree of nasal tip projection and structural integrity of the lower lateral cartilages. Toriumi described the use of caudal extension grafts in cases of caudal septal deficiency [1]. The septal extension graft secured the nasal tip to the septum, effectively controlling tip projection and rotation [1]. In the treatment of the crooked nose, spreader graft and spreader flap techniques are widely used for the correction and stabilization of the middle vault [5]. When we evaluate alternative techniques; similar techniques integrating tip support, dorsal support, and rotation typically require piecemeal grafting or suturing a separate cartilage component [6].

Extracorporeal septoplasty usually includes an integrated graft similar to the hammer graft, but we would like to point out that the hammer graft does not include an enlarged anterior septal angle [7].

For use in primary and revision rhinoplasty, a single piece and more stable graft was created with a hammer graft that supports the dorsal part of the septum instead of the spreader graft, the caudal part of the

septum instead of the columellar strut, and the prolongation of the septum as a modified single septal extension graft to increase the projection, and to adjust rotation instead of conventional septal extension graft.

### 5. Conclusion

We demonstrated the use of hammer grafts obtained from septal or costal cartilages in primary or revision rhinoplasty, respectively. The hammer graft integrates the structural grafting features of a columellar strut, spreader graft, and septal extension graft in a single piece of cartilage.

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### Funding

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### Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

### Informed consent

For this retrospective type of study informed consent is not required.

### Conflict of interest

None.

### References

- [1] Rohrich RJ, Durand PD, Dayan E. Changing role of septal extension versus columellar grafts in modern rhinoplasty. Available from *Plast Reconstr Surg* [Internet] 2020;145(5):927e–31e. <https://pubmed.ncbi.nlm.nih.gov/32332531/>.
- [2] Rohrich RJ, Kurkjian TJ, Hoxworth RE, Stephan PJ, Mojallal A. The effect of the columellar strut graft on nasal tip position in primary rhinoplasty. Available from *Plast Reconstr Surg* [Internet] 2012;130(4):926–32. <https://pubmed.ncbi.nlm.nih.gov/23018701/>.
- [3] Toriumi DM, Josen J, Weinberger M, Tardy ME. Use of alar batten grafts for correction of nasal valve collapse. Available from *Arch Otolaryngol Head Neck Surg* [Internet] 1997;123(8):802–8. <https://pubmed.ncbi.nlm.nih.gov/9260543/>.
- [4] Tastan E, Sozen T. Oblique split technique in septal reconstruction. *Facial Plastic Surgery* 2013;29(6).
- [5] Newberry CI, Mobley S. Correction of the crooked nose. Available from *Facial Plast Surg* [Internet] 2018;34(5):488–96. <https://pubmed.ncbi.nlm.nih.gov/30296801/>.
- [6] Brenner MJ, Hilger PA. Grafting in rhinoplasty. *Facial Plast Surg Clin North Am* 2009;17(1):91–113. <https://doi.org/10.1016/j.fsc.2008.09.009>. PMID: 19181282.
- [7] Spataro EA, Saltychev M, Kandathil CK, Most SP. Outcomes of extracorporeal septoplasty and its modifications in treatment of severe L-strut septal deviation: a systematic review and meta-analysis. *Dec 1 JAMA Facial Plast Surg*. 2019;21(6): 542–50. <https://doi.org/10.1001/jamafacial.2019.1020>. PMID: 31621791; PMCID: PMC6802231.