Hezarfen Wings: A Lower Lateral Cartilage-Based Cartilage Suspension Technique for the Adjustment of Nasal Tip Rotation and Projection and the Correction of Supratip Deformity

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Abstract: Nasal tip surgery is one of the most important parts of rhinoplasty to achieve an attractive nose. There are numerous techniques focusing on the correction of nasal tip rotation and projection. In this article, a new cartilage support derived from the cephalic border of lower lateral cartilages is used for the adjustment of tip rotation and projection, whereas improving supratip fullness is presented. Bilaterally harvested cartilage extensions are resembled as bird's wings and dedicated to the wings that were created by the world's first scientist who flew from one continent to another: Hezarfen Ahmed Çelebi.

Thirty-two patients who underwent open-approach rhinoplasty operation including the abovementioned method were evaluated retrospectively. After performing conventional steps of open approach rhinoplasty, a wing is created by making a cephalic incision parallel to the lateral crural axis leaving the medial attachment intact and then undermined. Then, the cartilage is turned over the midline bilaterally as it acts like a curb by pulling or releasing the wings to adjust to the desired tip rotation and projection and sutured to the repaired upper lateral cartilage roof. Other 2 types of using these wings were asymmetric suturing one of the wings to help in the redirection of deviated nasal tip (n = 12) and suturing each other at midline to support the overlying skin like a tent with supratip deficiency (n = 7).

The authors presented here both esthetic and functional outcomes of Hezarfen wings' method that was used for both nasal tip adjustments and supratip support.

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Received August 1, 2013.
Accepted for publication November 13, 2013.

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There is no financial relationship between a company and the authors of this study.
Supplemental digital contents are available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.jcraniofacialsurgery.com).
The authors report no conflicts of interest.

ISSN: 1049-2275
DOI: 10.1097/SCS.0000000000000558

Key Words: Lower lateral wings, Hezarfen wings, lateral crus, nasal tip projection

(*J Craniofac Surg* 2014;25: 983–987)

Nasal tip correction is one of the most important stages of rhinoplasty. Forming a seemingly natural nasal tip requires the appropriate use of both cartilaginous grafts and tip suture techniques. In the literature, the pathophysiology of nasal tip deformities and solutions such as numerous tip suture and grafting techniques combined to cartilage resections or bending techniques to form an adequate definition while arranging tip projection and rotation were defined (Table 1).[1–14] We presented a new cartilaginous support for tip projection and rotation derived from a cephalic trim material.

As a conventional maneuver, cephalic resection from lateral crura is needed in some cases especially with bulbous dome. In the recent articles, such a resection is becoming restricted because of the reusable characteristics of these thin cartilage strips. They may be prepared as "sliding alar cartilage flaps" for lateral crural support,[15] whereas they are used as "lower lateral crural (LLC) turnover grafts[16] or flaps[17]" to correct lateral crural asymmetries. In addition, Ashtiani et al[18] used LLC cephalic portions as proximally based flaps to support the alar cartilage and to correct LLC deformities. In this study, new medially based cartilaginous extensions that were created from the cephalic margins of LLC were used to adjust both nasal tip projection and rotation while improving supratip fullness (Fig. 1). These flaps are dedicated to the wings that were designed by the world's first scientist who flew from 1 continent to another: a legendary Turkish aviator of the 17th century, Hezarfen Ahmed Çelebi.

MATERIALS AND METHODS

Thirty-two patients, who underwent open approach rhinoplasty between May 2010 and April 2013, were analyzed retrospectively. Mean age was 29.46 years (range, 18–46 y). Female-male ratio was 1:36 (15/11). Seven of the patients had secondary nasal deformities due to previous rhinoplasty sessions, who presented with supratip deficiency and inverted "V" deformity, whereas the others were of primary cases. The study included patients with 0.8-mm or wider lateral crura.

TECHNIQUE

All patients were operated on under general anesthesia. Local anesthetic solution containing 0.0125 of adrenaline plus lidocaine (20 mg/mL) was administered to control intraoperative bleeding and decrease postoperative pain to all the areas to be dissected. This was followed by Goodman inverted V-shaped transcolumellar incision in all patients. After providing the surgical exposure of dorsum, nasal tip, upper and lower lateral cartilages, and nasal septum, conventional

TABLE 1. The Common Nasal Tip Refinement Techniques in the Literature

Basic Techniques to Improve Nasal Tip Projection and Rotation
Medial crural anchor suture of Joseph (refined by Tebbetts)[18]
Gruber septocrural rotation suture[10]
Gruber medial crura, footplate suture[2,17]
Tebbetts systematic nondestructive approach[18]
Tardy transdomal suture[19]
CS grafting[13]
Shield grafting[1,2]
Lateral crural steal technique[6]

rhinoplasty steps, which are shown in Table 2, were performed including Hezarfen wings' (HW) method.

In cases of primary rhinoplasty with enough LLC width, a 5- to 7-mm wide cartilage was left at the caudal part of lateral crus while creating HW by incising cephalic portion (Fig. 1). The medial end of the incision was extended to the medial crura at least 3 mm to prevent columellar hanging. After the incision, undermining of the cephalic portion of lateral crus was performed from lateral to medial to protect the mucosal lining (Figs. 2A, B). Five of the secondary cases did not have enough septal remnants to use for columellar support. In the first 8 cases of the series, a columellar strut (CS) graft was also used for additional tip support.

After creating HW, 3 types of usages were defined. In type 1 HW, it was used as a symmetrical curb to adjust the rotation and projection of the tip, and bilaterally wings were sutured to the repaired cartilaginous dorsum (n = 20) (Fig. 3). Type 2 HW was used in patients who needed additional support to prevent relapse of axial deviation of the nasal tip, by pulling the wing opposite to the deviation more than on the ipsilateral site (n = 6) (Figs. 5 and 9). Type 3 was used for supratip fullness in which both HWs were sutured together and was also used for the upper lateral cartilages at midline to form a scaffold for dorsal skin (n = 6) (Fig. 7). Photographic views of types 1, 2, and 3 case samples are presented in Figures 4, 6, and 8, respectively. All the secondary cases were selected as suitable candidates for harvesting HW, that is, they had lateral crura with a minimum of 8-mm width.

Nasal packing was not performed as long as there was no any serious bleeding at the end of the operation due to conchal resection

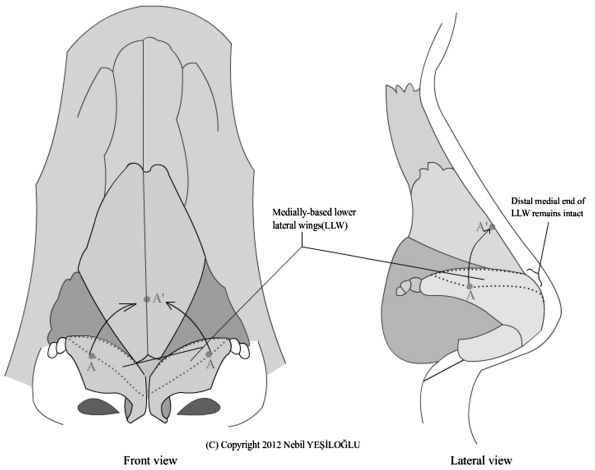

FIGURE 1. Planning of the HW method.

TABLE 2. Procedures That Were Performed Before and After HW Flap Use

Common Procedures That Were Performed in Rhinoplasty	No. Cases
Dorsal osteotomy	25
Lateral osteotomy	25
Paramedian osteotomy	18
Percutaneous lateral osteotomy	7
CS	8
Dorsal bilateral spreader grafts	29
Dorsal asymmetric spreader grafts	3
Iliac crest bone grafting (for saddle nose)	3
Septocolumellar suture (for hanging prevention)	1
Endoscopic bullous concha resection	16
Radiofrequency for concha	26
Septoplasty	30

or ablation via radiofrequency. A dorsal nasal splint was used in all patients at the end of the operation and maintained for 1 week.

RESULTS

Mean follow-up was 23.9 months (range, 11–34 mo). Mean HW width was 4.2 mm (range, 3.5–4.9 mm). All the patients expressed their satisfaction from the results of the operation in their personal interview except for 1 patient. That patient was a cocaine-addicted woman who was revised for septal perforation and columellar hanging after 1 year from the initial operation. The perforation was closed with septal buttons, and hanging of the columella was repaired by using septocolumellar suture. Definitive treatment of the perforation has not been planned yet because of the continuing addiction. This patient was excluded from the satisfaction. In 1 patient, a secondary camouflage operation with temporal fascial graft was needed because of skin atrophy and obvious cartilaginous frame after the second operation. In all secondary cases after that patient, fascial wrapping was also used. Any of the patients experienced airway obstruction due to internal or external nasal valve insufficiency. Nasal dorsal length increased by 1 to 2 mm, whereas nasolabial angles decreased by 1 to 3 degrees after the first year in patients with both used and unused CS. A decrease of 1 to 2 mm in tip projection is recorded in both groups.

DISCUSSION

Nasal tip projection and rotation are some key steps of rhinoplasty to achieve a desired overall nasal shape. Nowadays, both suture-only and cartilaginous grafting techniques were defined to adjust nasal tip position as mentioned before.

The CS graft, one of the most commonly used methods for tip adjustment, was revisited in a recent study by Rohrich et al.[19]

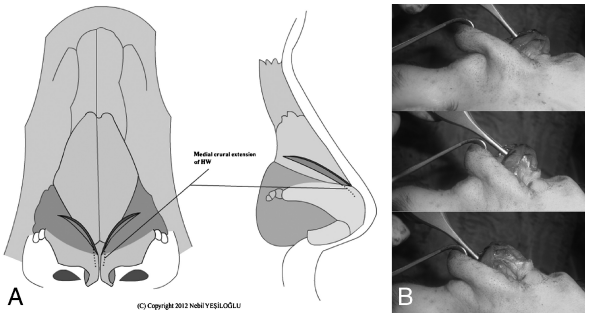

FIGURE 2. A, Schematic view of harvested HW. B, Intraoperative lateral view of HW; note that underprojection, normal projection, or overprojection is available by pulling or pushing the HW.

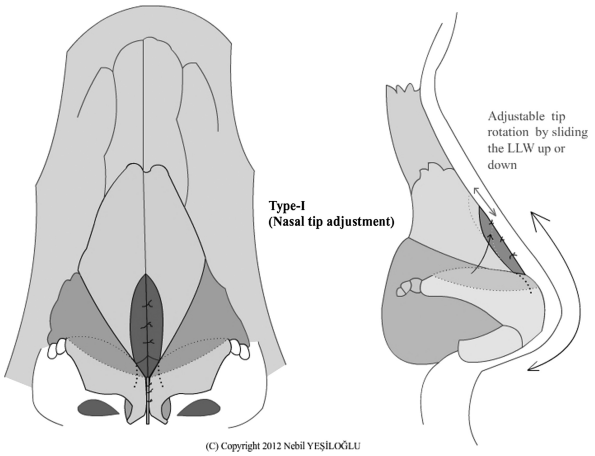

FIGURE 3. Schematic drawing of type 1 HW use; suspension for nasal tip projection and rotation.

They commented on a computer analysis of CS grafting in rhinoplasty and concluded that noses that used CS graft would have a decreased projection in time rather than an increased projection (65 versus 27 patients). However, this finding is multifactorial; it seems that CS alone is not enough to maintain the nasal tip support. In our 13 cases with a minimum of 15 months of long-term follow-up period, there were 1- to 2-mm decrease in projection and 1- to 2-degree decrease in rotation. In 7 of these patients, CS was also used for an additional support, but there were no marked changes in projection and rotation or in nasolabial and nasofrontal angles by time in patients who both used and not used CS. However, in our opinion, follow-up period longer than at least 2 years is needed to assess these patients for tip measurements and late results of the technique.

Among the tip suturing techniques, Tebbetts tip rotation suture is a useful technique for nasal tip rotation from the nasal dorsal septum to the medial crura.[12] In our technique, the medial end of the incision is extended to the medial crura to produce Tebbettslike effect to prevent hanging columella. According to our experience, the pivot point of the HW method can rotate the nasal tip better than suture-only techniques between the medial crural cartilage and the septal cartilage[8–10] in which pulling vector is far from the tip area.

For rotational improvement, caudal septal resection from anterior septal angle is sometimes used.[14] However, this is an irreversible maneuver if an overresection is performed. The HW method provides a nondestructive reversible rotation for nasal tip.

Appropriate use of both suture techniques and cartilage grafts is necessary for nasal tip refinements to achieve a good result. Kuran

FIGURE 4. A 24 year old patient and Type-I use of HW; before (top) and 18 months after the operation (bottom). In this patient, after refinement of the nasal tip with inter-domal sutures, rotation is achieved by using HW and projection is carried 4 mm proximal to the initial position. No graft suspension techniques were used.

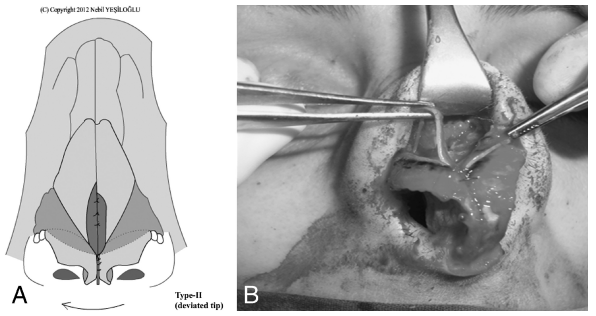

FIGURE 5. A, Schematic view of Type- II HW use; improving axial deviations of nasal tip. B, Intraoperative asymmetric adjustment of a HW.

et al[20] analyzed their tip refinement results and concluded that cartilage grafts should be used if augmentation is needed, whereas suture techniques are enough alone for rotational alterations. However, combinations of both suture and cartilage grafting techniques were needed especially in our secondary cases. In our opinion, a mixture of both techniques is needed for most patients. The HW method, like the other techniques mentioned previously, can be successfully combined to other stages of rhinoplasty.

Supratip deficiency is another goal of the treatment with HW method. Kim et al[21] reported different supratip deformities that needed the augmentation of nasal tip and dorsum with cartilage, crushed cartilage, or silicone implants. In addition, fascial grafts combined to fat were used for this aim. In our cases, HWs were turned over midline and sutured together to fill the supratip space. It acts like a scaffold in the area. A restriction of the technique is the length of the cartilage wings that is not enough for the augmentation of bony deficiency. However, in most cases, wing length was enough to augment the keystone area.

As Janis et al[17] pointed out, vertically disoriented alar arch leads to primary external valve insufficiency and potential alar collapse during inspiration. In our technique, axis of alar arch becomes more horizontal, prevents external nasal valve collapse (see Supplemental Digital Content, Video, http://links.lww.com/SCS/A85), and causes ease in breathing.

Normal tip of the nose has a bendable anatomy due to soft tissue ligaments and thin structure of tip cartilages.[7,8] In our personal experience, some of our primary rhinoplasty patients defined a restricted unnatural flexibility and discomfort of nasal tip accompanying a slight pain at the nasal base even with small touches to the nasal tip, and this was thought to be a reason of CS, shield or

FIGURE 6. A 31 years old patient with and Type- II use of HW to support septal correction; Before (top) and 21 months after the operation (bottom). In this patient, asymmetric spreader graft to the right side of septum was adapted plus to the fixation to anterior nasal spine.

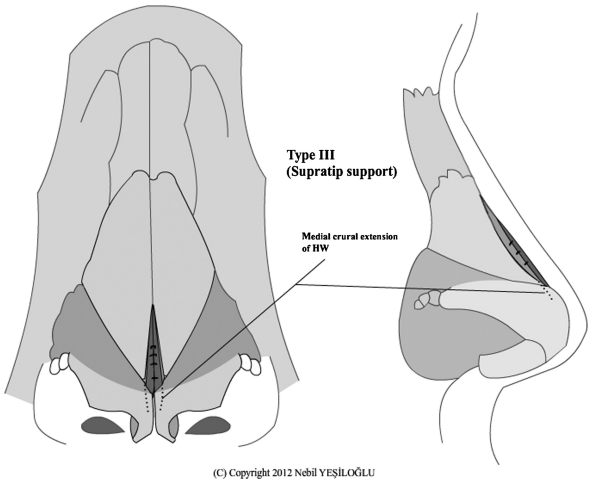

FIGURE 7. Schematic drawing of Type- III. HW is used for correction of supratip deficiency.

other grafts, and multiple stabilization sutures. This stiffness of columellar region was still continued in some patients after the first year of surgery. In patients who used HW alone, tip flexibility returns at the end of 3 months providing a more natural consistency when palpated.

In type 2 HW, nasal tip lateral direction is supported by asymmetric pull of HW. However, extended deviations of the bony septum and lateral wall asymmetries should be corrected before the arrangement of HW.

As a limitation of the technique, HW is unsuitable for harvesting in patients with inadequate lateral crural width. In such patients, other projection and rotation maneuvers may be needed.

CONCLUSIONS

Providing a natural shape of the nasal tip is one of the main goals of rhinoplasty. In this study, we presented a new method as a component of tip shaping to adjust rotation and projection, to correct axial asymmetries of the tip, and to support the supratip area. Other advantages of the HW method are the following:

FIGURE 8. A 43 years old patient with supratip deficiency and Type- III use of HW, before (top) and 28 months (bottom) after surgery. This patient was a secondary case with 9 mms width of lateral crura. However the previous surgeon was only addressed for his septal deviation and there was no enough septal remnants for any cartilaginous graft preparation. Therefore HW method was useful for supporting supratip deficiency.

FIGURE 9. The intraoperative view of the patient in Figure 8. Note that both HW are sutured together at midline to form a scaffold under the skin. An additional fascial graft was lied over the cartilaginous scaffold for the camouflage of the cartilaginous skeleton.

1. Provides a nasal tip suspension without a cartilage graft
2. Does not distort the nasal tip or cause columellar hanging
3. Helps external nasal valve opening
4. Is a reversible technique if required
5. Provides an esthetically pleasant nasal tip

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