Severe nasal tip–deformities require demanding reconstructions. Deficient cartilaginous framework is replaced with autogenous cartilage grafts with similar shape and consistency to native alar cartilages fashioned from septal, auricular, and costal cartilages (CCs), which are attached to the remnants of the septum, residual medial crura, the remnants of domes, and lateral crura to restore the skeletal framework.1

METHODS
This study enrolled 4 secondary and 1 tertiary rhinoplasty cases with severe deformities of medial and lateral crura of the lower lateral cartilages (LLCs) who have undergone operations with composite reconstructions between January 2015 and December 2016. We focus on tip reconstruction of these composite cases with our new grafting technique. All patients underwent open secondary or tertiary rhinoplasty. An autologous CC graft has been used in the 4 secondary cases, and a cadaveric CC graft has been used in 1 tertiary case. In this tertiary case, an autologous CC had been already used during the second operation, and the patient was reluctant for another autologous cartilage sacrifice.

For tip reconstruction of 3 of the 5 cases, we have prepared a long strut graft from a CC and then split the graft tip 5–6 mm vertically into 2 equal halves to create a gamma (ϒ)-shaped strut graft. We have sutured the base of this graft to the nasal spine and/or the bases of the medial crural remnants. Then, we have prepared lateral crural grafts and secured the grafts over lateral crural remnants. Then we curved the split tip winglets of the ϒ-shaped strut graft to both sides and sutured them to lateral crural grafts in order to create a new dome. Splitting of the CC strut graft reduces the need for extensive suturing at the tip, obtains smoother contours and ensures graft economy, and provides an original and stable dome shape. The bending capacity of the CC is limited in middle-aged patients. Costal allografts from a young cadaver can be a good alternative. Y-shaped costal crural graft is useful for medial crural and domal monobloc reconstruction in secondary and tertiary cases. (Plast Reconstr Surg Glob Open XXX;6:e1629; doi: 10.1097/GOX.0000000000001629; Published online 28 December 2017.)

SUMMARY: In severe nasal deformities, the original cartilages are removed, or they become unusable because of previous operations. Costal cartilage (CC) is one of the most important tools for the replacement of deficient nasal osteocartilaginous framework. In 4 secondary and 1 tertiary rhinoplasty cases with severe deformities of medial and lateral crura of the lower lateral cartilages, we have prepared a long strut graft from a CC and then split the graft tip 5–6 mm vertically into 2 equal halves to create a gamma (ϒ)-shaped strut graft. We have sutured the base of this graft to the nasal spine and/or the bases of the medial crural remnants. Then, we have prepared lateral crural grafts and secured the grafts over lateral crural remnants. Then we curved the split tip winglets of the ϒ-shaped strut graft to both sides and sutured them to lateral crural grafts in order to create a new dome. Splitting of the CC strut graft reduces the need for extensive suturing at the tip, obtains smoother contours and ensures graft economy, and provides an original and stable dome shape. The bending capacity of the CC is limited in middle-aged patients. Costal allografts from a young cadaver can be a good alternative. Y-shaped costal crural graft is useful for medial crural and domal monobloc reconstruction in secondary and tertiary cases.
Then we have supported the shape of the dome by intradomal and interdomal sutures for more natural appearance (Fig. 2).

In 2 of the 5 cases, the lateral crura of the LLCs were well preserved, and we have sutured the winglets of the \( \Upsilon \)-shaped costal strut graft to the LLCs.

**RESULTS**

Three patients were male and 2 were female. The patients’ ages varied between 25 and 46 years (average: 33.6). The mean follow-up period was 13.8 months (range: 6–24). Results were satisfactory in all patients (Fig. 3). In 1 patient, however, we faced alar mucosal inward bulging because of pushing of LCGs, causing a breathing problem because of narrowing of the external valve. During her revision after 14 months of our first operation, we have removed some soft tissue at the region of the bulging and have solved the valve narrowing.

**DISCUSSION**

\( \Upsilon \)-shaped strut graft provides a nice basis for easy, robust, and safe tip reconstruction. This 5–8 mm splitting of...
the strut graft and creating 2 winglets reduces the need for extensive suturing at the tip region, obtains smoother contours, and ensures graft economy. The thickness of the columella does not increase with the addition of medial crural grafts. Bent winglets at the tip provide a near original and stable dome shape. Cap or shield grafts can be used over Y-shaped strut graft for additional projection.

An oblique cut splitting (cutting the lower edge of the winglets 3 mm deeper than the upper edge) may separate the lower edge of the 2 winglets more to provide better divergence angle between them. A triangular space created between the 2 winglets results in better and more natural nasal tip reconstruction (Fig. 2).

If the lateral crura of the LLCs are well preserved, then the winglets of the Y graft can be fixed to these original cartilages. It results in more natural alar consistency and shape; however, this choice depends on the condition of lateral crura.

During our research on literature, we have seen 1 new article recommending the utilization of the columellar strut graft with a special anatomy in the shape of a Y on a horizontal plane. However, this was different from the shape we have proposed. In that article, the strut graft was prepared in the shape of a triangular prism, supporting the divergence angle between the medial crura in a primary rhinoplasty. What we have proposed here is a reconstruction model to be used in secondary or tertiary rhinoplasties with nearly total losses of cartilaginous tip support.

In nasal deformities requiring composite reconstruction, strut grafts are usually attached to grafts used for reconstruction of the nasal dorsum. This causes restriction of the nasal tip movement, which we have also faced in our cases. However, this limitation is not specific to this technique but a general dilemma for corrections where the strut graft is fixed with the dorsal reconstruction grafts.

The bending capacity of the CC is limited after middle age. This may hinder the use of this technique. Costal allografts from a young cadaver can be an alternative in these cases. The absence of donor-site morbidity is another advantage of the allografts. However, its absorption probability and the cost remain as considerable concerns. During the revision of our tertiary reconstruction case with alar mucosal inward bulging, after 14 months of cadaveric CC graft placement, we have observed that the cartilage had not been absorbed. Surely, we cannot compare this with Dr. Daniel’s huge experience, but in case of obligation, cadaveric cartilages may result in long-lasting reconstructions.

Warping of the CC is another concern. We cut the graft pieces obliquely as described by Tastan and kept the pieces in an isotonic solution to assess their tendency for warping.

CONCLUSIONS

The Y-shaped costal crural graft is a good, safe, and natural alternative technique to consider for medial crural and domal monobloc reconstructions. It provides graft economy, and it is versatile to be used in all kinds of severe tip deformities.

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