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Hybrid Dorsal Preservation Rhinoplasty: How We Do It

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Abstract

Background: A difficult to correct dorsal K-area is a frequent cause of residual and/or recurrent dorsal hump in preservation rhinoplasty. Fragile osseocartilaginous elastic connections essential in static stability of nasal pyramid structure should be at least respected. A bulging of Upper Lateral Cartilage (ULC) caudally to this area are principal cause of cartilaginous hump, difficult to correct without damaging the stability.

Aim: A hybrid method of a combination of structural surgery with preservation attitude was suggested.

Methods and Material: Osseocartilaginous interconnection of DKA area (Dorsal K-Area) can be totally preserved with structural correction of the same area. An incision below of DKA interconnections, with high auto-spreader grafts instead of trimming the deformity was suggested.

Conclusion: Septal T-segment could be freely excised as needed, sutured with high and low auto-spreader graft, as well with septum in desired position, without jeopardizing static stability of nasal pyramid. In our patients, no residual and/or recurrent hump was registered in immediate and as well in long term results.

Keywords: Rhinoplasty; Preservation; Structural; Hybrid; Dorsal K-area

Introduction

Preservation as philosophy and surgical technique in rhinoplasty started to be a tendency in last few years. It could be considered as a fresh standpoint which became a widespread influence [1,2]. It cannot be stated as a new approach [3]. It was just put aside, as an underrated possibility of surgical resolution of nasal shape deformities [4,5]. In this particular article we were focusing our attention merely on dorsal preservation rhinoplasty [3].

Dorsal osseous deformities are predominantly resolved by rhinosculpture (osteoplasty), preferably by piezo-electric powered instruments with or without different type of osteotomies [3,6-9]. The basic idea of dorsal preservation rhinoplasty, as in preservation attitude in general, is to maintain the Dorsal Key Stone (DKA) area intact, namely its elastic bony-cartilaginous connection [3,10].

The evidence of a certain recurrence of dorsal hump was confirmed in long term results (residual or recurrent by spring effect of manipulated structures) [10,11]. This deformity, even though, could be considered minor in majority of cases, but it is a frequent reason for a secondary rhinoplasty intervention [10,11].

A possible way of hybrid approach to dorsal key area is presented in this article, as eventual resolution of this inconvenient complication, usually needing surgical correction.

Material and Methods

In this study were included 124 patients, 76 Female and 48 Male. The age was between 16 to 48 years old. All patients presented in the study had a significant osseocartilaginous septal deviation, confirmed by CT-scan and/or endoscopy.

Follow-up of 2 years within regular intervals (3-9-12-24 months post-op).

Description of the surgical procedure

- Cottle endonasal septoplasty (by hemi transfixion incision) was performed in all patients, to correct the structural septal deformity.
- Subperichondral or supraperichondrial/subperiosteal access to nasal pyramid was

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Table 1: A distinctive procedure divided by area of nasal pyramid.

Bony part of pyramid	Rhino sculpture (Osteoplasty)/uncapping	Osteotomies (medial oblique, intermediate, lateral complete/incomplete	Ostectomy, Lateral wedge of maxilla and/or nasal bones
Dorsal K-Area (DKA)	Preserved osseocartilaginous junction ("V" incision 2 to 3 mm below of junction)	No trimming of DKA	Resection of septal T-segment as needed
Middle valve area	High auto-spreader flaps formed of redundant cartilage of hump	Suture in "V" of high auto-spreader flaps with remnant cartilage of DKA	Classical auto-spreader flaps of ULC, if needed.

Figure 1: Dorsal K-area exposed by open rhinoplasty access; A and B. De-capping dorsal irregularities by piezo-electric instrument.

performed by open rhinoplasty access.

- A rhinosculpture by piezoelectric instruments was used for deformities of the bony nasal pyramid (Figure 1).
- Uncapping of nasal bones until de osseocartilaginous junction was done in all patients.
- In 43 patients a rhino sculpture was performed alone.
- In 68 patients osteotomies were performed bilaterally in consonance of the need: one or more paramedian and one lateral low-to-low incomplete osteotomy.
- In 13 patients an excision of bony fragments of "processus frontalis" of the maxilla was performed (Figure 2).
- A splitting of the nasal vault was done on the cranial border of ULC cartilage in "V-form" 2 mm to 3 mm below the osseocartilaginous junction (Figure 3, 4).
- The elastic osseocartilaginous junction of DKA was preserved/intact.
- The surplus triangle of ULC on both sides of DKA area become evident and bulging.
- The underlining mucosal layer was dissected from cartilage of middle vault, in extension sufficient to form auto-spreader flaps.
- Submucosal splint of septal T-segment was done, on both sides (Figure 3A, 3B).
- The surplus septal T cartilage (superior border) was excised sufficiently to reduce cartilaginous hump (Figure 4A, 4B).
- Preserved superior border of ULC in "V"/"S" DKA area (mucosa and perichondrium free) was turned-in and formed high bilateral auto-spreader flaps (V-shaped on both sides).
- Suture of preserved cartilage caudal to osseocartilaginous junction was done with high auto-spreader flaps on both sides (Figure 5A, 5B).

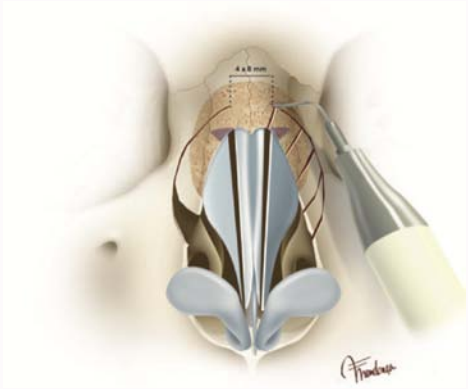

Figure 2: Different types of Piezo-electric powered osteotomies with the preservation of intact bony bridge (4-8 mm).

- Each auto-spreader flap in its distal portion was sutured (separately and with interrupted sutures) with septal cartilage.
- Suture of subperiosteal e subperichondral triangular flap (with the base on its cranial insertion) to its caudal insertion (marked previously on beginning of dissection).

Discussion

Very valuable and important efforts were done to prevent necessity of secondary revision rhinoplasty in the case of recurrent hump after preservation rhinoplasty. Surface Preservation (SP) techniques are offering a preservation attitude concept with different solutions to this problem, namely preventing radix step and an advantage of visually controlled transverse osteotomy performed by endonasal access [12,13].

Neves et al. [14] offer minimal interference with soft tissue suprastructure of nasal pyramid. The recurrence is resolved by Tetris

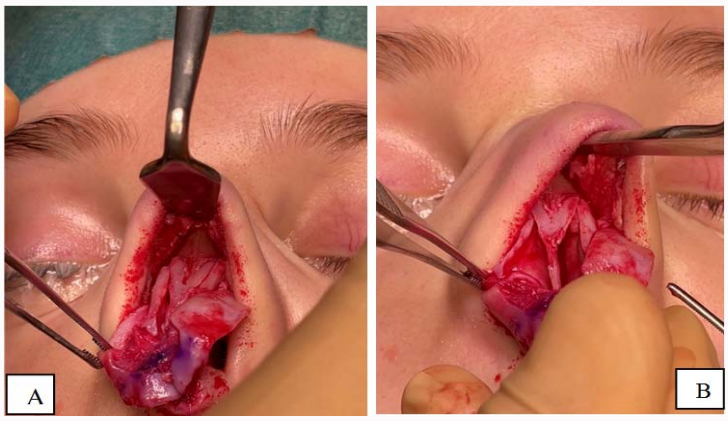

Figure 3: A) exposure bulging cartilaginous hump; B) "V" incision below the osseocartilaginous connection of Dorsal K-area on both sides.

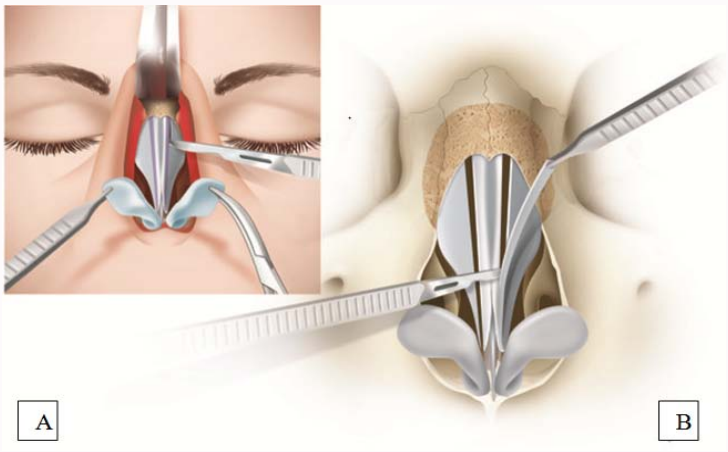

Figure 4: A and B: prolongated to longitudinal incision on cranial bother of ULC.

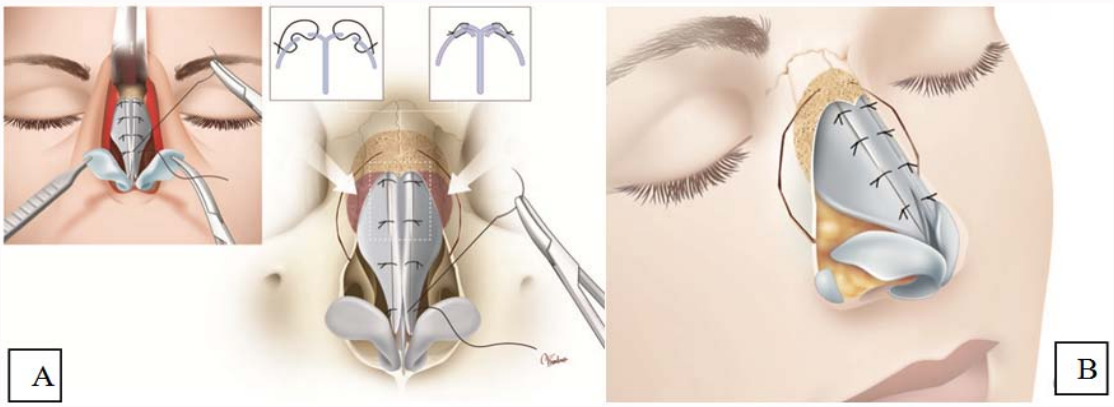

Figure 5: A and B) Sutures of "V" incision, auto-spreader flaps with superior border of remaining septal T or septum.

concept and fixation of the cartilage on different statically important points, either of quadrangular septal cartilage or nasal floor [14,15]. A fixation of the middle valve in right position, by ligaments suturing is another option [1].

Attention to cartilaginous part of dorsal K-area was already given previously [15]. The stress was put on its specific form ("V" or "S" shape), forming cartilaginous hump difficult to reduce and control [11,15].

In long term follow-up, a dorsal hump recurrence is unfortunately present in certain percentage all mentioned options (21% in Modified spar to 9.8% in Tetris concept and 3.3% in Lateral Tetris concept) [11]. An incorrect definition of nasal deformity leads to erratic indication for some preservation surgery [10]. This attitude augments significantly the necessity for revision surgery (from around 5% to 19%), especially when associated with septal deformity, even a minor one [10,11].

A novel attitude was systematized by Saban et al. [10], defining an exact indication for each procedure where is essential point is an exact and correct definition of nasal deformity. Due to correct definition of deformity, a correct surgical procedure could be used, in order to diminish the need for secondary surgery, as it was confirmed with the use of uncapping associated to a classical preservation technique (diminishing from 18% to 3%) [10], in a case of need for a septoplasty (minor or mayor procedure) as an important structural component, a revision necessity is augmenting 2.5 times [10].

The surgical technique presented in this article, is offering a possibility to fulfill all preservation concept requirements, associated with possibility to correct mayor deformities of nasal septum and mayor deformities of nasal pyramid itself. Even though the subperichondral and subperiosteal access was preferred, sometimes was possible only supraperichondral exposure, due to fragility of cartilage itself [1,16]. In our patients, there was no difference in results due to different cartilage exposure and mentioned types of dissection were not the object of this study.

The dorsal bony part was treated either by rhino sculpture and lateral osteotomies (complete or incomplete) with or without lateral and inferior wedge excision (ostectomy) to entirely resolve the bone deformity [3,12,13,17]. Robboti et al. [18] presented a possible hybrid approach to dorsal remodulation of nasal humps with minor bony component. In this approach, a septal T segment is preserved, after cartilaginous infra-kyphotic split, but a DKA area is separated, trimmed and sutured "end-to-end".

In our approach the osseocartilaginous elastic connection of DKA was untouched and undamaged (Table 1). The deformity of cartilage in "V" or even worse "S" form was modified and improved with no need of excising the tissues. Actually, this redundant and deformed part of the cartilage was perfectly serving for creation of high auto spreader flaps. There was no need of interruption of osseocartilaginous articulated connection in DKA area, due to incision done 2 mm to 3 mm below mentioned DKA area.

This small strip of cartilage was easily sutured with high auto-spreader flaps in "V" form. The interior convexity of middle nasal valve was maintained in this cranial part, as well as in caudal part by classical auto-spreader flaps of ULC and untouched Lateral K-stone Area (LKA). Excising of a septal T segment in order to reduce hump, if performed in this away, was not compromising the middle nasal valve. It was permitting a precise correction of deformity in a difficult to treat area, with a structural support.

In this series of patients, there was no residual and/or recurrent hump, either immediate or in long-term result. In addition, a desired polygonal form of nasal pyramid in cranial part was easily obtained, just because of following a natural structural anatomy of the area and preserving it in totality [19]. As any human activity, a rhinoplasty is subjected to a change.

The intelligence is initiative and ability to adapt to change, by a quote attributed to Hawkins [20,21]. Attitudes modify and influences come. We can decide, either we accept them or not. An influence can be a passing trend, a fashion of the moment, or a new and fresh change in performing or thinking. Also, we can modify an influence, in accordance with our needs. We can find a way to continue to fulfill our requirements, as well as it could be incorporated in an actual trend.

Due to this premises a novel, hybrid approach to Dorsal Preservation Rhinoplasty was presented. The definition of word hybrid implies a combination and fusion of completely different entities, taking advantage each from another. By this Hybrid method in dorsal preservation rhinoplasty, so called "difficult" noses can be ameliorated, structure can be preserved, and aesthetic defect can be solved, without the recurrence of deformity. The method in our hands works.

Conclusions

1. There is certain reappearance of nasal hump after preservation rhinoplasty.

2. The Dorsal K-Area (DKA) is a frequent cause of residual and/or recurrent dorsal hump in this type of surgery.

3. A bulging of ULC caudally to DKA is principal cause of residual or/and recurrent cartilaginous hump.

4. The hybrid method of totally preserving osseocartilaginous interconnection of DKA and LKA that preserves the complete structural support was presented.

5. Incisions below DKA area were executed and high auto-spreader flaps were formed.

6. Reducing of the hump was performed by septal T segment trimming or excision as needed, followed by suture of high and low auto-spreader flap with nasal septum in desired position.

7. No residual and/or recurrent hump was registered in immediate and as well in long term results, in our patients.

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