Extended Dorsal Preservation in a New Concept of Preservational Rhinoplasty

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Abstract

Background: A dorsal preservation rhinoplasty concept was discussed and the benefits vs. contraindications and limitations were presented. In specific cases of severe nasal septal deformations associated with necessity of major septoplasty, focused on perpendicular plate, a New Concept of Extended Dorsal Preservation Rhinoplasty is presented (New Extended PR-D). PR-D is based on septoplasty, rhinosculpture and partial osteotomies.

Goals: The objective of this paper is to present a new approach in some cases of rhinoplasty named as extended dorsal preservation rhinoplasty.

Methods and Results: Partial and incomplete osteotomies were introduced as method to avoid disinsertion of nasal pyramid of glabellar area and to avoid bony step in areas off osteotomy cut. Rhinosculpture in its extended mode was promoted for modulation of bony structure with obtaining immediate aesthetic and structural results, minoring a surgical trauma.

Conclusion: The principles of Preservation Concept were respected in this New Extended PR-D Concept.

Keywords: Preservation Rhinoplasty; Partial Osteotomies; Rhinosculpture; Dorsal preservation rhinoplasty

Introduction

Rhinoplasty is more than a surgery, it is not just a change of the shape of a nose, can be consider as a philosophy, a duty and a responsibility. Duty and responsibility to the patient, which aims to transform and shape.

Aesthetics is disputable. Aesthetic patterns are variable depending of the cultural, social and economic status. It is essential to listen, to understand what a specific person wants and try to approximate the final surgical result to their desires according to our individual surgical skills.

It is not just desirable it only to change features of a nose; but above all, interfere with patient’s body image and self-esteem. Their life takes a turn over, sometimes accepted with delight and gratitude and sometimes more or less badly faced.

Surgical cutting should not be just the main factor, it is again and above the all the responsibility of this procedure and medical approach. It is desirable to preserve as much as surgeon can, structures and function, preserving and protecting patient’s individuality and respecting his personality.

The uttermost important responsibility for the surgeon, as one more duty and another obligation, is professionalism. The professionalism includes the intellectual capability, the skillfulness and the knowledge.

The process of acquiring knowledge is never ending line, is a sinusoidal curve, with ups and downs, quoting Finocchi [1]. It has to be faced with a humble attitude and seriousness, understanding that every “bottom” of the curve is actually a possibility to grow, to learn and to get closer to perfection, instead a personal defeat.

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The beauty must be the simplicity. It is important to admitted differences in concept and definition of beauty, but on the end of the line the patterns stay simple, even though adapted to anthropological concepts. The beauty is a respect, for structures and function.

As well as the beauty, the process of restoring and/or achieving it has to be kept simple. The transformation has to be done with minimal possible changes, reaching as much possible pleasable...
The emerging overwhelming concept of surgical preservation is related to structure, to anatomy and consecutively to the function, and is well defined in concept of Preservation Rhinoplasty (PR) [2].

By another definition, it could be divided in some different ways that are shown in Figure 1. The first is the PR-S, which can be defined by elevation of the Skin Tissue Envelope (STE). The second is the PR-D, which can be defined by the preservation of ossecartilaginous vault of the nasal dorsum. The third one is the PR-A, which can be defined by a minimal or no alar resection, sutures for reshaping the tip area [3]. All those preservation rhinoplasty types could be overlapping, combining different types of surgical preservation, unitifying itself in complete Preservation Rhinoplasty (PR-C) [3].

The best indications for PR-D are very well defined in the medical literature [2,3]. PR-D is suitable to corrections a dorsal nasal pathology with classical nasal situations, as listed ahead [4]. Those situations are a straight nose with or without moderate hump (rhinion and kyphion); a short nasal bone with weak upper lateral cartilages; and a tension nose with compromised internal nasal valve shown in Figure 2.

Otherwise, the PR-D has some limitations, such as follows a big hump; or some irregularities on nasion, rhinion and big kyphion of nasal pyramid; or a long nasal bone and/or thick nasal bones [3].

In a nasal surgery, the surgeon can reach very important aesthetic and functional results [2].

The Extended Dorsal Preservation Rhinoplasty Concept (Extended PR-D Concept) was performed in 37 patients. Patients had nasal pyramid deformity such as slight dorsal deviation, big hump, long nasal bone with thick ones, asymmetry and irregularities on dorsal ossecartilaginous pyramid and broad nasal “bridge”, isolated or combined.

To complete, all the patients had significant structural internal nasal deformity documented by nasal tomography (CT) scan and rhinodebitomanometry. Trauma etiology was found in only 2 patients and development deformation in the others 35 patients. All procedures were performed after informed written consent.

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The rhinosculpture was performed by rasping the bony hump and/or irregularities on dorsal and lateral surface of nasal bones by piezo scrapping tip, also with hard and fine rasps (RHS1, RHS2HB and RHS2FB). This must be delicated, and concerning for not disturbing the K-stone area, even in patients with prominent hump following principles of preservation attitude [4, 5]. This example can be shown at Figure 3.

A "LOW-to-LOW" osteotomies was performed by piezo scrapping tip (RHS1), as shown in Figure 4. The oblique cut, of the bony surface, started on the border of the piriform aperture [4,5]. When reached
the area of medial eye canthus area, 2 mm lower of it, the orientation needs to turn upwards in the direction of the maxillary-nasal suture that surpasses for 2 mm to 3 mm. The cut/osteotomies should end between 2 mm to 4 mm in front of the junction of the nasal bones (sutura internasalis) on the midline, and it is important to adapt to each patient’s anatomy [6]. This can be exampled in Figure 4 and 5.

Sometimes, it is necessary an intermediary osteotomies, that were performed in the cases of slight crooked nose on previous fracture line, up to 3 mm to 4 mm laterally of sutura internasalis, cranially of K-stone area [4,6]. It is important to highlight that there was no secondary deviation of the bone fragments in the follow up of 1-2 years in all patient.

Discussion

Nasal pyramid deformities implicate different clinical situations and solving as shown in Figure 6 [7,8]. A nasal pyramid deformity, deviated and/or irregular, can be checked as a simple and “superficial” observation in physical examination and maybe the surgical planning can look relatively easy. However, in some cases, a surgical planning is not so linear.

The boundaries between those patients are actually a severe septal deviation presented on CT scan, similar to shown in Figure 7. This kind of septal deformity does not allow the classical removal of a strip of high septal cartilage and perpendicular plate [2]. So, a structural inner nasal deformity is a “challenging” surgical issue [9].

In these situations, a severe nasal septal deviation is present with the functional necessity to remove the perpendicular plate of ethmoid bone in order to establish normal respiratory function. So, it is important to highlight that in a nasal surgery, the surgeon can reach very important difficulties in some special structural issues that make PR-D not a good approach, as severe or complex septal deviations; Necessity to remove the perpendicular plate of ethmoid bone [3].

There is a tendency of superficial approach underestimating the “septal” surgical relevance. The tendency is to consider it as minor surgical procedure, with no importance and easy to perform, especially by young trainees. There is no preoccupation with the structure, airflow, and pressure or air resistance. This attitude is maybe one of the principal iatrogenic causes of nasal pyramid deformity.

Frequently forgotten, the fact is that structural deformities of interior of the nose, cartilaginous and osseous, as in any other
constructional and mechanical system, define the outer and external deformities and it is very important and obligatory to be corrected. These types of patients have the best and correct indication the New Extended concept of PR-D.

In the new concept of Extended PR-D, a structural correction of the inner nasal deformities, which includes major septoplasty with removal of perpendicular plate, and reestablishing a normal function of the nose, is a mandatory surgical goal. This functional correction attitude gives us the important aesthetic contributes, needing just a slight plastic retouch to achieve an almost perfect aesthetic.

Classical PR-D concept resolves minor deformities with otherwise balanced nose [2,3,4]. It needs the exact excision of infra dorsal septal (Vitruvian maneuver, Tetris concept) combined with lateral and transverse osteotomies, to obtain a perfect profile, with minimal surgical trauma and preservation of K-area [10]. This technique, by letdown and pushdown techniques, is separating the nasal pyramid of its insertion of maxillofacial skeleton on behalf of preserving the K-area [4,6,10].

In any procedures of straightening of the width of a nasal pyramid or repositioning of the deviated nose in the midline, osteotomies are conventionally used [9-18]. Changes introduced lately in osteotomy technique, improved dramatically postoperative results. In other words, a “perforating” line effect of 2 mm to 3 mm osteotomes which preserve periosteal connections and reduce the soft tissue damage in external percutaneous osteotomies [19-21].

With the new technology Ultrasonic Piezo-electric cut instruments, the surgical trauma was practically resolved and the precision was obtained, especially when done by open approach, with direct vision, as well as augmented security avoiding undesirable prolongations of the fracture line and the preservation of the inner periosteum [17-29].

The “bone step” as result of the any type of osteotomy (even with piezo-electric tools) is inevitable, except in some maneuvers as in described in the “slide down” manoeuvre [5, 25].

In our experience, deformities initiate caudally of intercanthal line, which is in average 7 mm to 10 mm below of the sutura nasofrontalis [30]. It is a perfect place to locate a transverse osteotomy or 1 mm to 2 mm below [31].

The presumption of the concept of Classical Preservation Rhinoplasty is to have a straight septum or minor septal deformity easy to correct and it is essential to support disinserted structure, a “floating” nasal pyramid [3].

To prevent undesirable mobilization, it is required a cranial fixation of disinserted (“loose”) pyramid or harmonization with camouflage procedure like free- diced cartilage [29,30]. This is not an easy and clear procedure as in Gubisch technique, due to a height, high localization, of the form and the cut itself [9,29,30].

In the case of severe structural deformity of nasal septum in its cartilaginous and/or bony part (quadrangular cartilage, vomer and perpendicular plate of ethmoid bone) it is practically impossible to maintain this concept.

From another point of view, a possible solution in this type of pathology, which needs structural support like in major septal deformities, but respecting the principles of preservation rhinoplasty, is the new concept of extended dorsal preservation rhinoplasty (Figures 7-11).

The most evident deformations of the nasal bone pyramid are located on the caudal border of the nasal bones (margo inferior ossi nasalis and rhinion) which denotes the K-stone area needing for its correction with rhinosculpture, plus lateral and intermediate osteotomies [4,6,32].
The damage of the K-stone area is avoided by using the rhino
sculpture concept. The use of the scraping tool from ultrasonic
piezotome allows to reshape the dorsum and maxilla. The uncapping
of the bone over the upper lateral cartilages is necessary; preserving
always the dorsal integrity and this step is very important and happens
in a lot of cases.

Minor osseous deformities and irregularities can also be restored
by this method without a need to separate and/or break the nasal
bones or the processus frontalis. Ultrasonic-piezo electric equipment
permited to shape and reshapes the bony part without the need
to disrupt the ossecocartilagious connection of the K-Area and
maintaining the upper lateral cartilage undamaged. The minor bony or
even moderate bony humps were easily removed [22-25].

Afterwards, as described, a “LOW-to-LOW” osteotomies were
performed after scraping the maxillary bone, starting from perform
aperture and without junction in the midline. In our patients, a
forming of “floating” pyramid was prevented by the preserving a
fragment of the nasal bones in millimeter distance (3 mm to 4 mm) of
the sutura internasalis bilaterally.

With this bone preservation, osteotomies (intermediate as well as lateral) turned to be incomplete (partial). This tiny bone
connection was sufficient to support the nasal pyramid. Maintaining
the connection with glabellar region (sutura frontonasalis) additional
support was reached, providing even more stability with no need
for fixation of suspended fragments [29,30,32,33]. This fact made
possible performing one and/or two more intermediate osteotomies
on secure approach.

By the principle of “pressure spring”, the spontaneous positioning
of deviated/fractured fragment can be reached into the correct
position. Commonly complete osteotomy leads to “sinking” of the
free fragment and over correction, needing doubtful repositioning
measures and/or camouflage techniques.

In this new surgical concept of partial osteotomies, the elasticity
of the tissue corrects the defect appropriately, on the right measure
and on right location. Without the use of force it just “sits” in right
position, and still maintains secured by midline junction. Also, the
bony “step” in nasion area was avoided, especially with obliquely
oriented piezo-electric cut [32-34]. It has been decreased even mores
a “step” by previous piezo-electric scraping of the maxillary bone, on
the locations where the osteotomy should be performed.

In actual state of our surgical progress, based on two years
follow-up period, some points in our attitudes towards Preservation
Rhinoplasty were very well clarified as bellow.

1. Classical PR-D concept should be selected to patients with
strait or slight deviated dorsum, with small bony hump, short nasal
bones and presence of structural septal support (straight or slightly
developed/defomed nasal septum).
2. With an open surgical approach rhinoplasty assisted by piezo-
electric instruments.
3. The preservation of upper lateral cartilages (especially Key-
area) is obligatory in every primary and possibly in revision cases due
to use piezo-electric instruments.

Due to impossibility and limitation of the Classical Preservation
Rhinoplasty Concept in some specific cases, we try to perform the
new Extended PR-D Concept. It is destined to severe nasal sepal
deviations/deformations and functional necessity to remove or vastly
resect perpendicular plate of ethmoid bone. Partial and incomplete
osteotomies are necessary to achieve good results. Also, it is necessary
to perform a carefully rhinosculpture.

In the “jungle” and the “noize” of information all around rhinoplasty surgery, the correct pathway of acquiring the knowledge
is a difficult task. Without the correct and expert senior orientation
it is even harder.

Sometimes we are driven to “misty” areas, “wondering”, “lost” in
concepts, techniques and skills. Confusions and contradictions leave
us undecided and susceptible to make mistakes. But, the capability to
hear, to see, to elect, to select, to doubt, to prove, to double check can
leads us to correct direction.

On the end, we can define our choice, define our strategy and
finally name our concept. It worked for our patients and us. The
objective was fulfilled and utmost concept of medicine was respected:
“Primum nil nocere” by Ἱπποκράτης ὁ Κῷος (Hippocrates of Kos)
(460BC-377AC).

Conclusion

The benefits vs. contraindications and limitations in dorsal
preservation rhinoplasty concept were presented. In severe nasal
septal deformations associated with necessity of major septoplasty
associated to pyramid deformity a New Concept of Extended Dorsal
Preservation Rhinoplasty is presented (New Extended PR-D).

The New Extended PR-D Concept is indicated in case of pyramid
deformity as more large (not only minor) humps, long and thick nasal
bones, wide nasal bridge, slight asymmetries and bony deviations.

The New Extended PR-D is based on septoplasty, rhinosculpture
and partial and incomplete osteotomies.

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References

1. Finocchi V. The Learning Curve of Preservation Rhinoplasty. In: Saban Y,
2018;139-55.
2. Saban Y. Preservation Septoplasty & Rhinoplasty in deviated Nose. In:
3. Rollin DK. Preservation Rhinoplasty: Rational & Overview. In: Saban Y,
2018;18-29.
4. Palhazi PD. Essential Operative Anatomy for Preservation Rhinoplasty. In:
Bio Ofset. 2018;45-73.
5. Saban Y. Step by Step Closed Rhinoplasty with Dorsum preservation. In:
6. Krmpotic-Nemanic JDW, Helms J. Chirurgische Anatomie des Kopf-
7. Robotti E, Hept WJ. New tools and proven techniques in rhinoplasty.
8. Robotti E, Penna WB. Current practical concepts for using rib in secondary


