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## Conservative Surgical Approach to Restore Necrotic Columella in Patients Undergoing Neonatal Usage of Nasogastric Tube

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### Abstract

#### Context:

A common complication, related to the use of nasogastric tube during the 1<sup>st</sup> day of life, is the necrosis of the columella. Esthetic damage in the early age typically leads to a healing request with very high result expectations.

#### Aims:

We aimed to develop and use an innovative surgical technique.

#### Settings and Design:

We used our technique in four cases.

#### Subjects and Methods:

Our technique requires two flaps designed with two paramedian release incisions. The two flaps will be sutured to what remains of the fibrous septum; finally, the two flaps will be sutured together in the medial region.

#### Results:

Postoperative course was devoid of any complication. All patients gained esthetic improvements and an increase in the volume of the columella on the sagittal and frontal planes.

## Conclusions:

This technique allows a conservative approach with low donor site morbidity and rapid postoperative course.

**Keywords:** Columella necrosis, maxillofacial surgery, minimally invasive surgery, plastic surgery

## INTRODUCTION

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A common neonatal complication, related to the use of nasogastric tube, is the necrosis of the columella. [1]

Esthetic damage in this area leads to a healing request with high result expectations.[2]

In case of necrotic areas involving the nasal cartilage, surgeons can treat this deficiency with the auricular cartilage harvested from the auricular concha.[1,3]

The major concerns of this surgical solution are related to morphological and esthetic characteristics of the donor site.

We started to use a surgical technique which can obtain excellent esthetic results, allowing a delayed second surgery.

## SUBJECTS AND METHODS

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Our technique requires two flaps designed with two paramedian release incisions: these flaps are isolated at the base of the nasal choanae and then they are slipped toward the tip of the nose, as long as they can be sutured. To ensure a good vascularization of the flaps, we maintain a vascular pedicle medially.

The two flaps will be sutured to what remains of the fibrous septum, or they will be stuck directly on the anterior border of the quadrangular cartilage; finally, medially the two flaps will be sutured together [ [Figure 1](#)].

The donor site where the flap was mobilized will be sutured without major surgical signs; in fact, in that area, we typically have access to a significant amount of excess tissue.

## RESULTS

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We used this technique on four young patients. The procedures in the study related to conducting, execution, and documenting follow the ethical principles listed in the Declaration of Helsinki and its subsequent revisions. The study was conducted according to the Italian and European Union laws. Ethics Committee approved this study. Informed consent forms were obtained from parents or legal guardians before patient enrollment in the study. Patients were all preterm born; such a condition made them undergo transnasal nutrition through nasogastric tube. The use of nasogastric tube caused the newborn patients the necrosis of columella, developing an esthetic damage to the lower portion of the nasal septum. Our technique that we used in all the four cases was the same as previously described, and the surgical equipment was the same in all the surgeries. The postoperative course was devoid of any complication. All patients gained esthetic improvements and an increase in the volume of the columella on the sagittal and frontal planes. No alteration of skin remained visible at 6 months after surgery. No functional abnormality of the patients was reported [ [Figure 1](#)].

## DISCUSSION

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Columella necrosis is not an unusual complication resulting from the use of inhalers for breathing in positive pressure of oxygen; such supports to breathing are widely used in cases of premature patients with difficulty to the autonomous breathing.[4]

Many techniques have been reported in literature to replace the necrotic columella. Some authors proposed to use auricular chondrocutaneous composite graft for columellar reconstruction; however, this technique creates imperfect esthetic outcomes, given the different colors of the harvested cutaneous flap.[5]

Our technique pays attention to the esthetic requirements and to the need not to create conditions of morbidity of the donor site.

Recently, other techniques that are aimed to use flaps from innovative donor sites such as pericranial flaps have been reported; such techniques are certainly less conservative and are indicated for adult patients, while they are absolutely useless in small-sized defects such as the columella necrosis of infants.[6]

The actual orientation of the plastic surgery is to combine surgical approach with the regenerative medicine: in many articles, interesting perspectives derived from the use of mesenchymal stem cells in maxillofacial surgery have been reported.[7,8,9]

The conservative approach reported here would be certainly improved with the use of platelets' concentrations[10,11,12,13] to improve the esthetic results and biomimetic scaffolds[14] and to improve the functional support.

## CONCLUSIONS

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This technique allows a conservative approach with low donor site morbidity and rapid postoperative course. The obtained results are optimal, both esthetically and also as functional response. An element susceptible of improvement is the morphology of the reconstructed columella, on the frontal plane: on this plane, in fact, the columella has a prominent profile on the transverse profile. However, the grafted tissue is reshaped into a second surgery, even after many years; therefore, such opportunity to improve the final result allows us to make possible surgical reopening when the patient has reached the maturation of hard and soft tissues.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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## Figures and Tables

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### Figure 1

[Open in a separate window](#)

(a and b) Preoperative image of the necrotic columella and a synthetic scheme of the flaps. (c and d) Postoperative image of the replaced columella and a synthetic scheme of the technique used. (e and f) Postoperative image of the replaced columella in frontal and sagittal vision

