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RESEARCH ARTICLE
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Perialar Flap Reconstruction Technique Approach of Nasal Columellar Dehiscence Post Trauma Continuous Positive Airway Pressure (CPAP)

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ABSTRACT

Introduction: Continuous positive airway pressure (CPAP) is often used in neonates with respiratory distress. However, long-term use of CPAP can cause columella necrosis. This mechanism results from a pressure injury or shear force when the device is applied to the nose. Techniques of columella reconstruction has its indications, advantages and disadvantages.

Case: A 9-year-old girl came with anterior nasal aseptum. The patient was born prematurely with a gestational age of 6 months. The patient then received ICU Treatment for Respiratory Distress Syndrome due to prematurity with CPAP for 3 months. The patient finished therapy but came home with a columella defect. On the Multi Slice CT-Scan examination, soft tissue defect columella were seen. The patient then underwent columella reconstruction surgery with the dextra et sinistra perilar flap technique.

Conclusion: Long-term use of CPAP increases the risk of columella injury. There is a need for both a preventive approach to the CPAP adhesion site in the nose to prevent further nasal injury and appropriate management of this injury. Columella reconstruction technique in the form of perialar flap technique in patients has satisfactory results.

Keywords: *CPAP, Defect, Columella, Perialar Flap*

INTRODUCTION

Continuous positive airway pressure (CPAP) is positive airway pressure that introduced intothe airways to maintain continuous pressure to keep the airways open constantly (Gupta & Donn, 2016). The columellais an important aesthetic unit that determines the projection of the tip of the nose, the nasolabial angle, and influences the relationship between base of nose and alar margin. However, the side effects of using CPAP cause hyperemia, edema, ulceration, and columella necrosis.

Mechanisms of injury include interface pressure, friction, shear force, and the creation of a warm, moist microclimate around the affected area. The reported incidence of nasal trauma globally ranges from 20% to 60% (Delmore et al., 2019). The management approach is surgical reconstruction technique either with graft, local flap,regional flap or free flaps. One of the local flap techniques is the perialar rim flap that standard alar rim flap reconstruction involves marking the bilateral alar margin flaps medially based on thenasal tip.

The surgical approach to the reconstruction of a columella defect is influenced by the local anatomy, the patient's health, the extent and depth of the defect and the character of the remaining tissue surrounding the defect (Nowicki et al., 2020).

CASE REPORT

A 9-year-old girl came with Anterior Nasal Aseptum. The patient had a history of premature birth at 6 monthsof gestation and underwent neonatal intensive care unit (ICU) treatment and installation of CPAP for 3 months. No complaints in the ears and throat. Physical examination showed anterior columella dehiscence, normal impression of nasalseptum, right & left cocha congestion, normal mucosa of vestibule.

FIGURE 1: Appearance and physical examination of the patient

Both otoscopy and pharyngoscopy examination found no abnormalities. A complete blood count did not reveal any abnormal results. Examination of the chest X-ray showed no abnormalities, however, on the Non-Contrast MSCT- Scan of Paranasal Sinus (Figure 2) was found soft tissue defect columella.

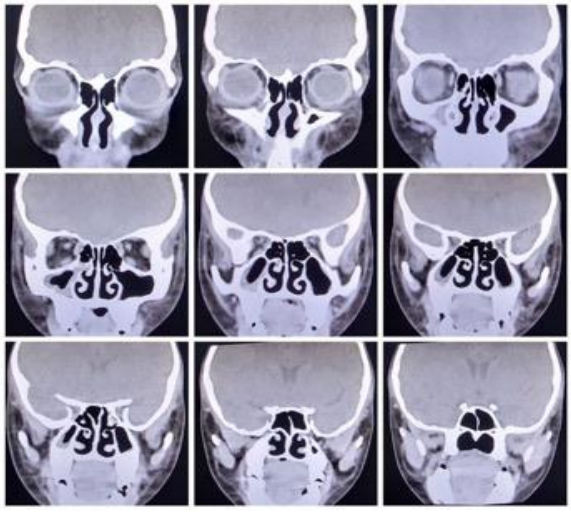

FIGURE 2: Non-Contrast Paranasal Sinus MSCT Examination

The patient then underwent surgical management of the columella of bilateral perialar flap on 23th –Nov - 2021 (Figure 3). Then performed wound control where the last visit showed satisfactory results (Figure 4). Here the comparison of nasal columellar dehiscence before and after reconstruction macroscopically (Figure 5). After reconstruction, there was significant tissue improvement.

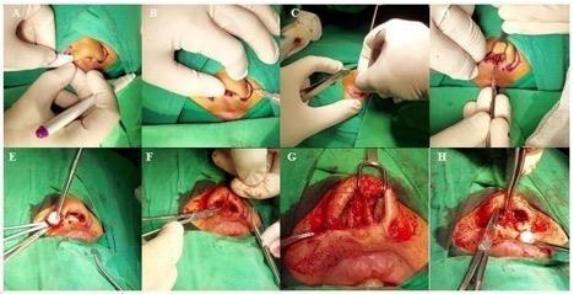

FIGURE 3: Perialar Flap Technique Reconstruction operation

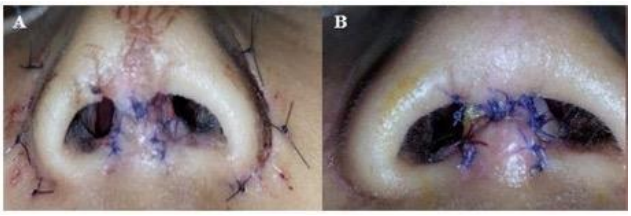

FIGURE 4: Postoperative wound control

FIGURE 5: Comparison before & after reconstruction macroscopically

A. Before reconstruction; and B. After reconstruction

Nasal trauma because CPAP is a side effect with potential short or long term onsequences, one of them is columella trauma in the neonate. Less than 1% of these patients develop irreversible ischemia and columellar soft tissue pressure necrosis. Complete necrosis of the columella produces a spectrum of nasal damage. The most severe deformity consists of a shortened and contracted columella with central soft tissue invagination, and nasal tip depression. Pressure on the nasal septum and surrounding tissues can obstruct circulation through the columellar, lateral, or dorsal arteries, causing passive hyperemia, which can progress to reactive hyperemia and possibly tissue necrosis. The esthetic impact of long-term use of CPAPis pig nose/snubbing which occurs secondary to being associated with recurrent sinus infections

ininfants and children. The aesthetic impact of this patient is that there is an invagination of scar tissue in the philtrum area and a shortened columella. The long-term effect of the columella defect was found multisinusitis on the results of the Non-Contrast MSCT-Scan Paranasal Sinus.

Columella reconstruction with alar rim flaps was first described by Gillies in 1949. This technique involves marking the bilateral alar margin flaps medially based on the nose tip (Nowicki et al., 2020). Reconstruction is usually delayed for allow baby to develop and spontaneoushealing to subside. Severe patients with residual functional and/or aesthetic impairment require reconstruction. While reconstructive requirements need to be individualized based on the degree of deformity, the combination of local tissue flaps and cartilage reshaping usually has satisfactoryresults. 4 There is no target age for perialar reconstruction but it is useful if there is no blood clottingdisorder, while in this patient the operation was performed at the age of 9 years.

Odobescu's modified perialar technique is designed by placing an incision in the alar-facialgroove and continuing to the most lateral level of the ala and then to the nasal vestibule to create a triangular full- thickness alar fold. The flap is removed by incising the alar facial groove into thevestibule of the nose. It is then rotated on the medial pedicle and rotated so that the distal end of the flap becomes the highest point of the columella. Next, the neo-columella is divided and the remaining pedicle is reinserted at the alar base (Odobescu et al., 2011).

CONCLUSION

Long-term use of CPAP increases the risk of columella injury. There is a need for both a preventiveapproach to the CPAP adhesion site in the nose to prevent further nasal injury and appropriate management of this injury. Columella reconstruction technique in the form of bilateral perialar flap technique in patients has satisfactory results.

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