

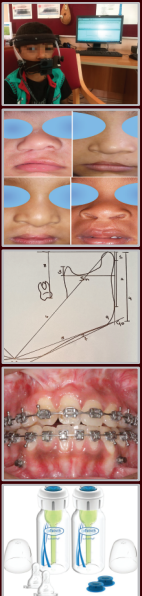
# JCLPCA

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# Nasal deformity correction with nasal prosthesis

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## ABSTRACT

Nasal deformities can vary in the form of severity. Several different factors such as congenital, burn and traumatic nasal fractures or soft-tissue injury/loss, neoplastic: defects resulting from surgery for the treatment of cancers causing compromise the structural architecture and functional framework of the nose. This case report describes the prosthetic rehabilitation of two female patients, one who was reported with congenital arrhinia and another one who had accidental electrical burns of the face. The surgeon's team as well as the maxillofacial prosthetics team discussed the treatment options with the parents and decided to rehabilitate with a nasal prosthesis. This clinical report is imparting an accessible and economic method for prosthetic rehabilitation of a patient.

**Key words:** Arrhinia, maxillofacial prosthesis, nasal deformity

## INTRODUCTION

Nasal distortions can be congenital, or due to burns, trauma, and neoplasia, causing compromise in the auxiliary design and utilitarian structure of the nose.<sup>[1]</sup> Recent advances in treatment and restoration, especially maxillofacial prosthetics, may ease the sequelae of many distorting medical procedures and helps in the form of function.<sup>[2]</sup>

For these two situation report, a conclusive attractive nasal prosthesis has been utilized for restoration of a fractional nasal deformity utilizing mechanical and anatomic retentive guides.

## CASE REPORTS

### Case 1

In 2010, an 8-year-old girl reported to our institute with a complete absence of nose since birth. The patient was complaining of breathing difficulty. On examination, absence of the nose, nasal root and nasal pits, longitudinal ridge-like protuberances in the mid-face, bulging swelling appeared near the inner corner of the right eye, fissured medial canthi of eyes bilaterally, bilateral strabismus, hypoplastic maxilla, microphthalmia, and hypertelorism [Figure 1]. Three-dimensional computed tomography information showed an atretic bony plate and the absence of piriform aperture and nasal bones, blockage of the nasal passages (choanal atresia) [Figure 2].

Surgical treatment of the congenital arrhinia was planned in two steps:-

In the initial step, correction of hypertelorism was done. Correction of arrhinia was done by raising dorsal nasal fold alongside maxillary labial sulcus cut and the nasal cavity was made by putting a nasogastric tube [Figure 3]. A "Spectacle osteotomy" was planned, and the orbits were mediatized in the wake of eliminating the overabundance bone from the midline nasal territory.

In the second step, careful adjustment of arrhinia was finished. This was accomplished by raising the dorsal nasal fold alongside maxillary labial sulcus cut and the nasal cavity was drilled through and through from

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superior anterior aspect to downward into the upper respiratory tract and putting an endotracheal tube to maintain the nasal airway. The patient was routinely followed up for 2 years [Figure 4].

The Surgeon's team as well as the maxillofacial prosthetics team discussed the treatment options with the parents and decided to rehabilitate with a nasal prosthesis. Adhesive-retained nasal prosthesis adhered to an acrylic base plate was planned.

### Fabrication procedure

Impression of the defect was obtained using Dentsply Aquasil Ultra LV low viscosity silicone impression reinforced with heavy body material. The silicone tube was replaced with the same diameter acrylic tube (coated with thin layer of Vaseline) before obtaining impression. The master model was constructed using die stone. A new silicone tube of the same diameter and length was taken, cut to the desired length and its outer edge diameter was increased with cold cure acrylic.

This was done to hold the tube against the skin. Two fenestrations were provided at 5 and 8'o clock positions

for breathing. An acrylic base plate was fabricated. Base shade was matched by intrinsically mixing pigments to the silicone elastomer that matches her skin tone. Platinum primer was used to bond the base plate to the silicone. The finished prosthesis was fitted and delivered to the patient and regularly followed up for 9 years [Figures 5 and 6].

Reconstruction of the external nose is planned at a later date once the child's nasal and maxillofacial development is complete.

### Case 2

In 2015, a 14-year-old young female visited our institute with a supposed history of unintentional stepping on the electrical compound and burned in the facial, stomach, hand, and feet locale. There is complaint of nasal regurgitation and broken nose appearance. On assessment, serious two-sided facial scarring was seen at the district of malar process, nasolabial sulcus, sidelong and dorsal part of the nose and philtrum.



Figure 1: Case 1 figure 1 (a) Preoperative Frontal view (b) Preoperative left lateral view



Figure 3: Case 1 figure 3 Correction of arhinia was done by raising dorsal nasal fold alongside maxillary labial sulcus cut and nasal cavity was made by putting a nasogastric tube



Figure 2: Case 1 figure 2 Computed tomography coronal view shows blockage of the nasal passages (choanal atresia)



Figure 4: Case 1 figure 4 Post-operative left lateral view



Furthermore, there was an exposure of nasal cavities and nasal septum. There was a loss of upper and lower lateral cartilage, columella, tip of the nose, and alar area [Figure 7]. The patient was counseled with the possible treatment options, and it was decided to go ahead with prosthetic rehabilitation. Two-part prosthesis with adhesive-retained acrylic base and magnet-retained silicone nasal prosthesis was planned.

### Fabrication procedure

Before taking the impression of the defect site, undesired undercuts inside the defect were blocked using Vaseline gauge. Impression was then obtained using an irreversible hydrocolloid material (alginate). It was then poured in die stone. The wax nose was then carved to desired shape and size that suits her face.

The patient's old photographs were used as a reference while carving the nose. A heat cure acrylic base plate was fabricated incorporated with 3 magnets (a bigger one on top and two smaller ones on each side of the inferior margin). The wax nose pattern was also incorporated with 3 counter magnets on its fit surface such that it retains to the acrylic base with magnetic force. The fit was then assessed on the patient and further refinements were carried out. The cured prosthesis was trimmed to remove any residual flash, and extrinsic tinting was carried out as final touch-up and sealed. The finished prosthesis was fitted and delivered to the patient with hygiene instructions [Figure 8].

## DISCUSSION

In several congenital and acquired facial defects, surgeons generally prefer the use of autoplasmic over alloplastic reconstruction, when significant. However, various defects still require prosthetic restoration.<sup>[3,4]</sup> The ideal treatment of arrhinia needs to arrive at a few focuses: to remake an outer nose which will go through negligible distorting or scar contracture, with the expected danger of late stenosis and to dodge damage to the tooth buds, which, in a developing youngster, are situated in a high situation in the hypoplastic maxilla.<sup>[5]</sup>

The material of decision for the creation of facial prostheses is silicone polymers which are of two types: room temperature vulcanizing silicone and high-temperature vulcanizing silicone<sup>[6]</sup> Silicone polymers have a few preferences, including substance dormancy, quality, strength, and simplicity of control.<sup>[7]</sup>

Two significant disadvantages of silicone are discoloration and degradation of material over time.

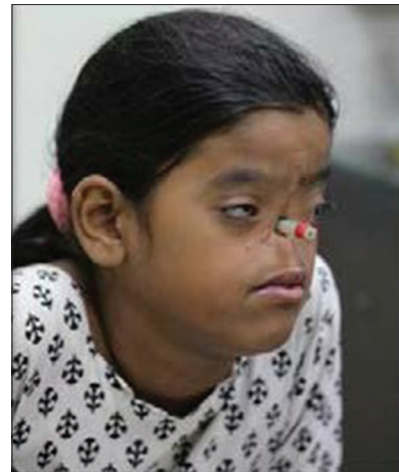


Figure 5: Case 1 figure 5 Nasal airway maintained through a 10-11cm long silicone tube



Figure 6: Case 1 figure 6 Post-prosthetic followup lateral view



Figure 7: Case 2 figure 7 (a) Preoperative Frontal view (b) Preoperative left lateral view

Various strategies can be utilized to hold the prosthesis, contingent upon the region and kind of deformity. They can be held in a pit precisely; set on the skin utilizing glues; upheld with osseointegrated implant, which has been utilized for maxillofacial recovery since 1979;<sup>[8]</sup> or held by magnets.<sup>[9]</sup> Three-dimensional printing is another, developing innovation that has the potential to reform clinical training and maxillofacial recreation.<sup>[10]</sup>



**Figure 8: Case 2 figure 8 Final prosthesis fit on the patient**

## CONCLUSION

These cases presented nasal rehabilitation treatment, for patients with complete congenital arrhinia and facial dysmorphisms caused by burns, with many associated anatomical malformations. The reconstruction gave the patients a positive boost of general, emotional, social, and physical well-being. The fate of maxillofacial prosthetics relies upon the improvement of new materials and methods, just as changing clinical assumptions about head-and-neck defects.

## 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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## Conflicts of interest

There are no conflicts of interest.

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