

# Creation of Adam 2.0 Appliance for Nasoalveolar Moulding of Cleft Lip and Palate: Case Report

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## ABSTRACT

Cleft lip and/or palate are the most common craniofacial anomalies in children. Nasoalveolar moulding is crucial because it can successfully close the gap. This ensures a better surgical outcome. The presented case report is of a five-day female infant with a unilateral cleft lip and palate. She was initially given a removable acrylic plate to mould the segments. However, the plate failed due to noncompliance of the parents. To remove the obstacle of parent compliance, a fixed plate was planned. The patient was treated by an appliance called the Creation of Adam 2.0. It consisted of two parts, both parts were retained *via* screws in the palatal segments. The traction force was applied *via* the power chain engaged in the attachments. With the help of this appliance, the cleft defect was reduced to about 1 mm at the end of the treatment in two weeks.

**Key Words:** Nasoalveolar moulding, Cleft palate, Cleft lips.

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## INTRODUCTION

Nasoalveolar moulding (NAM) is a procedure that facilitates plastic surgeons in surgical repair of cleft lip and palate.<sup>1</sup> However, its drawbacks include parent motivation, compliance, and soft-tissue ulceration.<sup>2</sup> Studies indicate that NAM has benefits, especially on the columella.<sup>3</sup> Yet, there are reports of stress among the parents. Anxiety levels of parents are significantly higher before plate insertion for NAM.<sup>4</sup> This case report shows a unique approach to NAM in a unilateral cleft lip and palate (CLP) patient by using a fixed appliance called the Creation of Adam 2.0.

## CASE REPORT

A five-day newborn female accompanied by parents came to the Cleft Lip and Palate Centre, Peshawar, Pakistan, with a chief complaint of a gap between the lips. On examination, she had a complete unilateral CLP on the left side. A detailed history was recorded along with pictures; the treatment planned was NAM. The patient in this case was first given a removable acrylic plate to mould the segments. However, the parents failed to comply with the procedure, resulting in the failure of the plate. Subsequently, in the best interest of the patient, a fixed plate was planned so that the minimum compliance would be required from the parents.

In this case, the acrylic plate was fixed to the palate *via* screws, eliminating the need for parental compliance and reducing the overall treatment time. The first step was parental counselling, followed by obtaining written informed consent from the patient's mother. After recording patient's weight and height, an impression was taken with silicon putty in an infant acrylic impression tray.

The appliance used was named the Creation of Adam 2.0 and consisted of two acrylic parts: one for the greater segment and the other for the lesser segment. A wire was fitted into the acrylic on both parts, from where a power chain would connect the two parts inside the mouth (Figure 1).

The two parts of the plates were checked for any rough edges and were polished. The patient was recalled, and the fitting of the two plates was checked in the mouth. Subsequently, holes were made in the two parts of the appliance for the screws. Three holes were made in the greater segment part and two in the lesser segment part through a handpiece bur. The patient was prepared for surgery. Oxygen and a pulse oximetre were available during the surgery. Local anaesthesia without adrenaline was administered to the palate. After a few minutes, the first part was placed on the palate, and the screws were inserted by a mandrill at 60-90 RPM. The dimension of the screws was 1.3 × 12 mm. After the placement of screws in the greater segment, the second part was similarly inserted in the lesser segment. At the end, a power chain was passed through the wire framework from the greater to the lesser segment and tied between them. Parents were counselled regarding the cleaning and care of the plate. A medicine kit was given for the child's care. The patient was scheduled for a follow-up after three days, and the parents were advised to come sooner if any complications occurred.<sup>5</sup>

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At the end of the treatment, due to the thickness of the acrylic plates, the cleft defect reduced from 12 mm to 1 mm.

When the cleft segments had approximated and the patient's weight reached 5 kg, the plate was removed, and the patient was referred to the plastic surgery for primary lip repair. Total treatment time was two weeks (Figure 2).

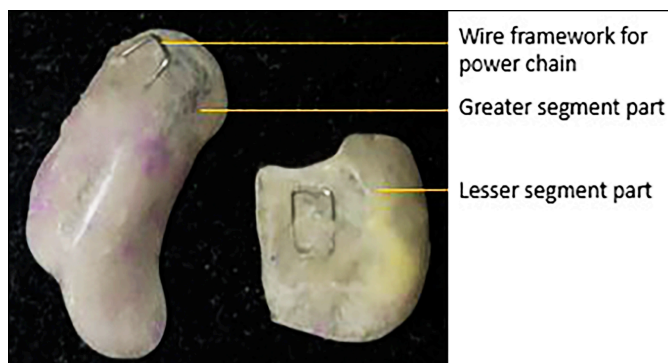


Figure 1: Creation of Adam.



Figure 2: Intraoral picture of the cleft defect: (A) Pretreatment (B) Mid treatment (C) Post-treatment.

## DISCUSSION

This patient was treated immediately on presentation to use the Matsuo concept, which suggests that high maternal oestrogen levels in the foetal circulation result in easy deformation of tissues.<sup>5,6</sup> Parents presenting to the CLP Centre, Peshawar, Pakistan, are usually uneducated; hence, compliance becomes difficult. Removable plates have certain complications, including skin and cheek irritation, dislodgement, and airway blockage, which can further reduce compliance.<sup>5</sup> Keeping the above two points in mind, a fixed plate was used to quickly mould the cleft segments.

The modified Latham technique has had its fair share of criticism in general. However, a study by Spolyar *et al.* showed that

the unilateral maxillary orthopaedic appliance retained with pins in the palate did not show any harm to the maxillary growth. Rather, it may have a stimulatory effect on maxillary forward growth.<sup>7</sup> Jodeh *et al.* used a modified Latham technique for the repair of unilateral CLP.<sup>8</sup> They showed that treatment time was reduced and did not necessitate a future need for Lefort 1 maxillary advancement. Also, shorter treatment time meant reduced burden of care on the families and healthcare providers. Jodeh *et al.* also reported a lesser incidence of palatal fistulae in patients treated with the modified technique for unilateral CLP.<sup>8</sup> Considering these studies in mind, the decision of a fixed appliance retained through screws was made.

Benitez *et al.* found that presurgical infant orthopaedics using removable plates significantly reduce the width of the cleft gap, with a reduction of 32.7%.<sup>9</sup> In the present case, a much larger reduction was observed.<sup>8</sup> This may be attributed to the fact that parental compliance was reduced due to the use of fixed appliance. Consequently, the Creation of Adam 2.0 successfully reduced the cleft gap in this case.

## PATIENT'S CONSENT:

Written informed consent was obtained from the patient's mother to publish the data concerning this case.

## COMPETING INTEREST:

The authors declared no conflict of interest.

## AUTHORS' CONTRIBUTION:

AMS: Design and drafting.

HK, SRS: Collection of data and drafting.

SS: Conception, drafting, and review.

All authors approved the final version of the manuscript to be published.

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