

Original Article

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## Unilateral Cleft Palate, a case report.

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### Abstract:

Orthodontists must initiate the treatments of infants with cleft lip and palate immediately after birth. One of the main objectives of this therapy is the guidance of the separated segments of maxillary alveolus into the semblance of arch configuration. However, during this procedure the relationship between mandible and maxilla should be taken into consideration. There are different types of early maxillary orthopedic appliances. In this article the modified Hotz type pre-operative appliance is introduced and the results of a patient treated with this appliance is presented.

**Key words:** Cleft lip and palate, Preoperative appliances

### Introduction

Cleft lip with or without cleft palate is one of the most common structural birth defects and it often requires treatment including multiple surgeries, speech therapy and dental and orthodontic treatments over the first 18 years of life<sup>1</sup>.

The importance of plates that have been used by orthodontists for cleft lip and palate treatment has been increasing since the introduction of the early maxillary orthopedics. This kind of plates are not only used for feeding but also used for treatment. For this reason, application of such plates are known as “early maxillary orthopedics”<sup>2,3,4</sup>.

Objective of early maxillary orthopedics is to achieve the normal features of non-cleft palate infants. The priority to reach the objective is to reduce the width of cleft and to draw the edges of the cleft to each other as close as possible. Nevertheless the relation between maxilla and mandible must never be neglected during the procedure<sup>5,6,7,8</sup>.

According to Huddart and Bodeham<sup>9</sup>, the success of cleft lip and palate treatment should be assessed in adulthood in terms of the presence of anterior and/or posterior cross-bite. The most frequently seen type of cleft lip and palate is unilateral cleft lip and palate thus most of the investigations are related to the treatment of unilateral clefts<sup>10</sup>.

In this article, the modified Hotz type preoperative appliance is introduced and the results of the treatment with this appliance is presented.

## APPLICATION OF HOTZ TYPE PLATE

The impression is taken from the patient with silicon based impression material and the patient's individual tray is prepared. Following the second impression taking, impression is poured in hard stone.

Subsequently the model preparation is passed to waxing stage. Waxing areas are alveolar crests, hard and soft palate regions. During waxing stage especially the buccal surface of the lesser segment and palatal surface of the greater segment are waxed. Following the waxing stage, plate is prepared (Figure 1).



Fig. 1  
Hotz type plate on the study cast

Circumferential borders of the prepared plate should be curved like those of the total denture. Especially posterior border, which touches uvula region, must be in contact with the soft palate and the extension must be inclined downward. Following the preparation of the appliance, the posterior contact of the appliance must be truly checked. This extension must be neither too long to make the patient vomit nor too short to let the food escape to nasopharyngeal area.

Particularly, the usage of a nipple is recommended in the beginning for retention. Most of the infants can suck after the application of the appliance. If not possible, mother's milk can be given with a feeding bottle. If the infant is nourished by a feeding bottle the hole of the nipple must not be large and the infant must be encouraged to suck. This will help the infant's lip musculature develop. After the application of the appliance, the initial control must be short and the following appointments must be arranged on a monthly basis and the development of the segments must be checked thoroughly.

## CASE HISTORY

The patient was a new-born male who had a unilateral complete lip and palate cleft on the right side. He was referred to our clinic soon after the birth. Preoperative appliance was prepared according to the procedure described previously.

In the present case, the infant went under lip operation in the 6<sup>th</sup> month and soft palate operation in the 18<sup>th</sup> month. Meanwhile the patient carried passive appliance. Hard palate operation was performed at the age of five.

Stone casts of the patient were taken from the 1<sup>st</sup> month to the 22<sup>nd</sup> month. The change in the cleft region is seen in Figure 2.

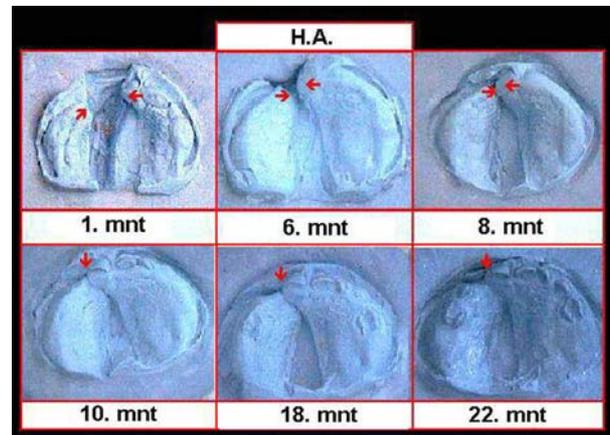


Fig. 2  
The change in the cleft region

The orthodontic stone cast of the three year old patient is seen in figure 3. In this figure no shrinkage but only open bite is seen at the cleft region.

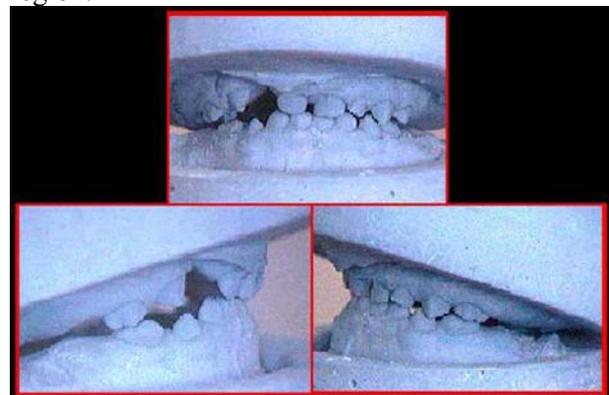


Fig. 3  
The orthodontic stone cast  
of the three year old patient

In addition to this figure, from Fig 4 to 7, the intra oral view of the patient at the age of 8 can be seen. Even though the patient had no orthodontic treatment other than preoperative appliance, there was no transversal or sagittal insufficiency in the maxilla. Cephalometric radiograph of the patient is seen in figure 8 and cephalometric evaluation in table 1.



Fig. 4  
Intra oral view of the patient



Fig. 7  
Intra oral view of the patient



Fig. 5  
Intra oral view of the patient



Fig.8  
Lateral cephalometric radiograph of the patient



Fig. 6  
Intra oral view of the patient

SNA	80
SNB	73.5
ANB	6.5
U1-NA (mm)	1
U1-NA (dg)	7
L1-NB (mm)	2.5
L1-NB (dg)	23
U1-L1	143
SN-GoGn	40

Table 1  
Cephalometric evaluation

## RESULTS

The surgical method and timing and the features of the preoperative appliance greatly contributed to the success of the treatment, thus there was no anterior or posterior crossbite at the end of the treatment. Furthermore, no scar formation was observed on the palate and the anatomical features of the palate including the shape of the rugae were identical to those of a non-cleft child of the same

age.

## DISCUSSION

There are different kinds of appliances used in the patients with unilateral cleft lip and palate. One of the methods is the narrowing of the cleft gradually as described by Mc Neil<sup>11</sup>. In the bilateral clefts, the cleft is widened by appliance with screw. Another method is the spontaneous closing of the cleft by passive appliance.

Various investigators notified no shrinkage in the infants with cleft and palate in the posterior region, on the contrary, in comparison to normal infant's palate, the transversal width of the palate was found to be wider<sup>6,10,11</sup>.

Hotz and Gnoski<sup>10</sup> stated that bringing the segments together was not recommendable even contraindicated.

Graf-Pinthus and Bettex<sup>5</sup>, in a previous study, investigated 18 unilateral complete cleft lip and palate patients aged between 10-12 years and found anterior cross bite in 5 of them, posterior cross bite in 2 of them and both anterior and posterior cross bite in 4 of them.

Normando et al<sup>7</sup> performed a cephalometric study on 113 operated and 91 non-operated cleft lip and palate adults and stated that operated unilateral cleft lip and palate patients had clockwise rotation and increased retroposition of the maxilla.

Filho et al.<sup>8</sup>, indicated that the adults with non-operated cleft had narrower arch width and longer arch length than the corresponding non-cleft individuals.

Hindrance of maxilla transversally, even for a short period of time by using passive palate results in the shrinking of the maxilla. As a result, the shrinking of the maxilla increases the risk of a cross bite in the future.

Several investigators believe that the patient must go under the operation as soon as possible and the anterior part of the appliance must be left open after the operation. As a result of guidance, the anterior part of the cleft is closed spontaneously through the guidance of the lips<sup>4,12,13</sup>.

Hochban and Austerman<sup>14</sup>, suggested that the operation should be performed in the 3<sup>rd</sup> month and right after the operation, trimming of the anterior part of the appliance must be started to let the effect of the lip take place.

Hotz and Gnoinski<sup>2,3,15</sup> stated that the appliance should be prepared closed in the anterior region and the lip operation should be delayed until the

6<sup>th</sup> month and they recommended the use of the appliance after the operation so as to prevent the collapse in the maxilla and the anterior crossbite risk.

As seen in the present case, even though there was no closing and rotational effect of lips, significant amount of closure was achieved in the anterior part of the cleft. Besides, by directing the growth and development until the 6<sup>th</sup> month and encouraging the infant to suck through lip exercises, a great amount of approaching of the cleft edges of the lip towards each other was observed.

Different kinds of methods have been used for preparation of the passive plates. In the method of Hotz and Gnoinski<sup>15</sup>, plate is fabricated using soft and hard acrylic and the trimming is performed palatomedially on the greater segment, anterolaterally on the lesser segment and vertically on both segments during the 4<sup>th</sup> and 6<sup>th</sup> weeks.

Hochban and Austerman<sup>14</sup>, apply only a passive plate made of hard acrylic and make the trimming by monthly controls.

Jacobsen and Rosenstein<sup>4</sup>, apply combined plate, made of both hard and soft acrylic.

For the reason that most of our patients come from rural areas, they can not follow their schedules regularly. Thus, waxing in the beginning, hinders the uncontrolled position in the cleft. In the present case, even though retention of the appliance was weak at the beginning due to the preparation with wax, adaptation of the infant and the tissues over time by using a nipple from the start of the treatment, solved the retention problem.

A more severe impairment of growth of the maxilla in the sagittal and frontal plane was observed after two-stage operations on the cleft palate<sup>16</sup>.

The results demonstrate the large variation in the severity of unilateral cleft lip and palate deformity at birth. Patients with large clefts and small arch circumference, arch length, or both demonstrated less favorable maxillary growth than those with small clefts and large arch circumference or arch length at birth<sup>17</sup>.

Unfavourable facial growth in patients with cleft lip, alveolus, and palate may occur during puberty. Usually this development is not predictable in a young patient<sup>18</sup>.

Similar to the present case, maxillary transversal and sagittal insufficiency is encountered in most cases.

## CONCLUSION

The Hotz type plate has proven to be an effective preoperative appliance for the treatment of

patients with unilateral cleft lip and palate.

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