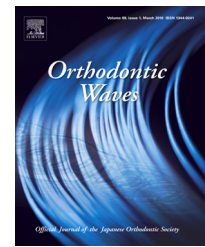


Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/odw

Original article

The effects of palatoplasty and pre-surgical infant orthopedic treatment on occlusion in unilateral cleft lip and palate patients

Mino Koshikawa-Matsuno DDS, PhD^{a,e}, Takashi S. Kajii DDS, PhD^{b,*},
 Mohammad Khursheed Alam BDS, PhD^c, Yuki Sugawara-Kato DDS, PhD^d,
 Junichiro Iida DDS, PhD^d

^a Department of Molecular Cell Pharmacology, Division of Oral Pathobiological Science, Graduate School of Dental Medicine, Hokkaido University, Sapporo, Japan

^b Section of Orthodontics, Department of Oral Growth and Development, Fukuoka Dental College, Fukuoka, Japan

^c Orthodontic Unit, School of Dental Science, Universiti Sains Malaysia, Malaysia

^d Department of Orthodontics, Division of Oral Functional Science, Graduate School of Dental Medicine, Hokkaido University, Sapporo, Japan

^e Private Practice, Sapporo, Japan

ARTICLE INFO

Article history:

Received 7 February 2014

Received in revised form

30 June 2014

Accepted 30 June 2014

Available online 22 August 2014

Keywords:

Dental arch relationship

Model analysis

Hotz plate

Palatoplasty

ABSTRACT

Purpose: The aim of this study was to evaluate the effect of pre-surgical infant orthopedic treatment (Hotz plate) and type of palatoplasty on the dental arch relationship and the dental arch morphology of unilateral cleft lip and palate (UCLP) patients.

Materials and methods: Seventy-four children with UCLP were divided into three groups. One group had undergone one-stage palatoplasty without Hotz plate (OSP w/o H), the second had undergone one-stage palatoplasty with Hotz plate (OSP w/H), and the third had undergone two-stage palatoplasty with Hotz plate (TSP w/H). We evaluated the dental models which were taken during initial examination at our orthodontic clinic, using the Goslon Yardstick, the 5-year-old index, and dental model analysis.

Results: Regarding both indices, there were no significant differences among the three groups. However, the dental arch width between maxillary deciduous canines in OSP w/H and TSP w/H was significantly greater than that of OSP w/o H. The dental arch width at the maxillary deciduous second molars in TSP w/H was significantly greater than in OSP w/H and OSP w/o H.

Conclusion: Dental arch relationship in UCLP patients was not influenced by the type of palatoplasty and the use of pre-surgical infant orthopedic treatment. Our results suggest that pre-surgical infant orthopedic treatment results in the increase of anterior dental width, whereas two-stage palatoplasty is significantly effective for increasing posterior dental width in UCLP patients.

© 2014 Elsevier Ltd and the Japanese Orthodontic Society. All rights reserved.

* Corresponding author at: Section of Orthodontics, Department of Oral Growth and Development, Fukuoka Dental College, 2-15-1 Tamura, Sawara-ku, Fukuoka 814-0193, Japan. Tel.: +81 92 801 0411; fax: +81 92 801 3608.

E-mail address: kajii@college.fdcnet.ac.jp (T.S. Kajii).

<http://dx.doi.org/10.1016/j.odw.2014.06.006>

1344-0241/© 2014 Elsevier Ltd and the Japanese Orthodontic Society. All rights reserved.

1. Introduction

Cleft lip and/or palate is one of the most frequent congenital anomalies in the craniofacial region. Generally, most patients with cleft lip and/or palate have some tooth anomalies, such as agenesis, peg shape and malposition of tooth [1]. Furthermore, most cleft lip and/or palate patients who underwent primary surgery reported major problems such as maxillary growth retardation and high incidence of skeletal Class III malocclusion [2–5]. Therefore, most patients with cleft lip and/or palate require orthodontic intervention from childhood. About 17% of the total patients visiting our orthodontic clinic are those with cleft lip and/or palate [6].

For orthodontists, it is useful and effective to evaluate the dental arch relationship of the cleft lip and/or palate patient before treatment, to assess the degree of malocclusion as well as the difficulty of orthodontic treatment and the prognosis. The Goslon Yardstick [5,7,8] and the 5-year-old index [9,10] have been used to evaluate the dental arch relationship of patients with unilateral cleft lip and palate (UCLP). These yardsticks rate the UCLP dental study models, placing them into groups 1–5. They have been widely used in inter-center comparative studies [5,7,11–13] and for intra-center comparison of treatment outcomes [14–17].

A majority of the UCLP patients undergo various clinical treatments before starting orthodontic treatment. We assumed that the clinical treatment procedures which influence the morphology and growth in the craniofacial area of UCLP patients mostly are pre-surgical infant orthopedic treatment and primary operations performed before starting orthodontic treatment. It would be useful for persons involved in the treatment of UCLP patients to examine how these postnatal treatments influence the growth of craniofacial area of UCLP patients. Therefore, we selected subjects focusing on two clinical factors, pre-surgical infant orthopedic treatment (the Hotz plate) and palatoplasty, and examined them using the Goslon Yardstick, the 5-year-old index, and dental model analysis. Many comparative studies investigated the effects of postnatal treatments on dental arch morphology of UCLP [3,14–16,18–26]. However, these studies are still controversial, because different centers used different protocols or compared only one factor. Accordingly, in this study, the subjects were treated at a single institute and two factors could be simultaneously compared in three groups, which have not been reported in other articles. We divided the subjects into three groups: the first group which had undergone one-stage palatoplasty without the Hotz plate, the second group which had undergone one-stage palatoplasty with the Hotz plate, and the third which had undergone two-stage palatoplasty with the Hotz plate. By comparing these groups, the effects of Hotz palate and type of palatoplasty might be clarified. We conducted to assess the correlation between the dental arch relationships or the morphology of UCLP patients and pre-surgical infant orthopedic treatment or type of palatoplasty by comparing in three groups.

2. Materials and methods

2.1. Subjects

One-hundred sixty-five non-syndromic UCLP patients visited our orthodontic clinic as new orthodontic patients within 10 years (from 1996 to 2005). A total of 74 subjects who satisfied the following criteria and agreed to participate were selected for the study: (1) patients who had undergone primary operation in our hospital, (2) patients who had received pushback palatoplasty with buccal flap or two-stage palatoplasty, (3) patients not under active pre-surgical infant orthopedic treatment and (4) patients who had not undergone alveolar bone grafting before initial orthodontic examination. Finally, 74 subjects (41 males and 33 females) were included in this study and the ages of the subjects ranged from 4 to 9 years with a mean age of 7.0 ± 1.2 years. Fifty-two patients had left-sided UCLP and 42 subjects had received pre-surgical infant orthopedic treatment with the Hotz plate. The Hotz plate is classified as a passive pre-surgical infant orthopedic appliance which is used to normalize the deglutition process, prevent the tongue from positioning in the cleft, and promote growth in cleft lip and/or palate patients [27–29]. Treatment with the Hotz plate according to a modified Zürich approach was usually initiated within 24–48 h after birth [29]. For lip closure, all the 74 subjects had been subjected to modified Millard technique [30] or the modified Millard technique with anterior palate closure by a vomer flap at the Department of Plastic Reconstruction Surgery of our hospital. Subjects underwent cheiloplasty at the average age of 5 months (range: 2–16 months). One-stage palatoplasty was performed using push-back technique with buccal flap and two-stage palatoplasty was performed using Furlow [31] or Perko [32] technique in this study. Sixty-two subjects had undergone one-stage palatoplasty at the average age of 18 months (range: 15–26 months) at the Department of Plastic Reconstruction Surgery of our hospital, and the remaining 12 subjects had undergone two-stage palatoplasty for closing the soft palate at the average age of 21 months (range: 17–29 months) and then closing the hard palate at the average age of 56 months at the Center for Advanced Oral Medicine of our hospital.

In the study, we divided the subjects into three groups: subjects who had one-stage palatoplasty without the Hotz plate (OSP w/o H, $n = 32$), the subjects who had one-stage palatoplasty with the Hotz plate (OSP w/H, $n = 30$), and the subjects who had two-stage palatoplasty with the Hotz plate (TSP w/H, $n = 12$) (Table 1).

Table 1 – Subjects.

Group	Male	Female	N	Mean age \pm S.D.
OSP w/o H	19	13	32	6 y 3 m \pm 11 m
OSP w/H	18	12	30	7 y 7 m \pm 15 m
TSP w/H	4	8	12	6 y 8 m \pm 11 m

S.D.: standard deviation; OSP w/o H: one-stage palatoplasty without the Hotz plate; OSP w/H: one-stage palatoplasty with the Hotz plate; TSP w/H: two-stage palatoplasty with the Hotz plate.

Download English Version:

<https://daneshyari.com/en/article/3170330>

Download Persian Version:

<https://daneshyari.com/article/3170330>

[Daneshyari.com](https://daneshyari.com)