

# An Assessment of Preoperative and Postoperative Nutritional Status in Children with Cleft Lip and Palate

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## Abstract

**Background:** Children with cleft lip and palate generally suffer from inappropriate and inadequate feeding, resulting in insufficient weight gain leading to malnutrition and poor growth. We aimed to evaluate the nutritional and growth status of cleft lip and palate children before and after reconstructive cleft lip and palate surgery.

**Methods:** All cleft lip and palate children aging from birth up to 36 months who were admitted to a referral Children's Hospital were investigated by a nutritionist. Data were collected using a questionnaire. About 5-6 months after surgery, data regarding their height, weight, feeding status and feeding difficulties were collected by telephone. Statistical analysis was performed using SPSS 18 software. For qualitative variables we used frequency and percentage and for quantitative variables we measured mean and standard deviation. We used Paired Sample T-test for comparing weight differences before and after surgery.

**Results:** In this study, formula was the most common type of feeding before and after surgery. Nasal regurgitation and insufficient sucking was the most common complaint of mother's before surgery, and also nasal regurgitation was reported as the most common difficulty after surgery, probably due to the need for reoperation. Bottle feeding was the most common method of feeding before and after surgery. After surgery only one mother claimed that her child spent more than 30 minutes for feeding. Weight for age of 18 children before surgery was lower than 5th percentile while after surgery this was reduced to 13 children. Also, there were significant differences between mean age before and after surgery which could implicate increase of weight after surgery.

**Conclusions:** Our study demonstrates the results of surgical repair of cleft lip and palate on nutritional status in children.

**Keywords:** Cleft lip, cleft palate, Feeding difficulties, Feeding, Growth

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## Introduction

Cleft palate and lip are common craniofacial anomalies with a wide clinical range from minor clefts in upper lip to complete clefts extending to nasal base including soft palate with or without hard palate involvement either bilateral or unilateral<sup>1</sup>. Cleft palate and lip prevalence depends on many factors with a worldwide rate of one per 700 live births (lower in Asians and higher in Europeans)<sup>2, 3</sup>. Nutritional and growth problems are common<sup>4</sup> among children with cleft palate and lip, and differ according to type and status of cleft<sup>2</sup>. The sucking mechanism is ineffective in these patients especially those with cleft palate resulting in inability to produce negative pressure

despite sucking movements leading to fatigue before completion of feeding<sup>5</sup>.

Nutritional recommendations differ in such patients<sup>6</sup>. However the priority would be continuation of feeding and replacement of an almost normal method of nutrition especially with methods increasing the oral movements for development of oral motor abilities<sup>7</sup>. The growth disorders in these children are mainly related to insufficient feeding; leading to low-weight infants in the first year of life, in which treatment is essential at early stages<sup>5</sup>. Treatment mainly depends on severity of the anatomic abnormality, age and medical condition of the child and other comorbidities. Surgical repair should be performed before 12 to 18

months of age<sup>8</sup>. We aimed to evaluate the nutritional and growth status of cleft lip and palate children before and after reconstructive cleft lip and palate surgery.

## Materials and Methods

In this cross sectional study, 61 consecutive children with cleft lip and palate at admitted to a referral children's hospital for surgical repair were enrolled. Age, gender, malnutrition, growth pattern, type and pattern of feeding, type of cleft, and feeding improvement were evaluated. Data collection was performed via interview and phone call by a nutritionist in two phases: preoperative and postoperative (after 5-6 months) stages.

Data analysis was performed by SPSS (version 18.0) software [Statistical Procedures for Social Sciences; Chicago, Illinois, USA]. Kolmogorov-Smirnov Z and Paired Samples T tests were used and differences were considered statistically significant at P values less than 0.05.

## Results

The mean age of patients was 9.33 (ranging zero to 35 months). Seven children (11.5%) were aged less than one month, 36 patients (59.1%) had age range from one to twelve months, 15 children (24.5%) were aged from one to two years, and three patients (4.8%) had age range from two to three years. Twenty nine patients (47.5%) were female and 32 patients (52.5%) were male. Ten cases (16.4%) had cleft lip, 26 (42.6%) had cleft palate and 25 subjects (41%) had both.

In the preoperative phase, 12 children (19.7%) were being breastfed, 28 patients (45.9%) were using formula, one child (1.6%) was using serum, 19 patients

Postoperative duration of feeding was less than 30 minutes in 41 patients (82%), 30 minutes in 8 children (16%), and more than

(31.1%) were using formula and breast milk, and one child was receiving formula and cow milk. Forty-seven mothers (77%) had tried breastfeeding: 17 (27.9%) less than six months, 2 (3.3%) six months, 4 (6.6%) more than six months, 11 (18%) current users, and 13 (21.3%) had started recently. The preoperative feeding problems are presented in Table 1.

In four children (7.1%) plates were used among them two were cured. Before surgery, 13 cases (22.4%) used a cup for feeding of these seven (58.3%) were cured. Twenty-three patients (39.7%) were fed by spoon among them 8 patients (42.1%) improved. Special bottles were used by 41 cases (69.5%) of which 34 patients (85%) were cured. Feeding duration was less than 30 minutes in 39 (69.6%) cases, 30 minutes in 9 (16.1%) cases, and more than 30 minutes in 8 cases (14.3%). The complementary feeding was initiated before six-month, at six-month, and after six-month in 8 (13.1%), 5 (8.2%), and 25 cases (41%), respectively. Also 23 patients (37.7%) were under the age of complementary feeding initiation. The feeding problems in these 38 children are shown in Table 2.

At the postoperative assessment, five patients were missed to follow-up, one patient died, and three had not been operated on. After exclusion of these nine cases, 52 patients were evaluated. Feeding was by formula in 33 children (63.5%), breastfeeding in 4 patients (7.7%), cow milk in 12 children (23.1%), one child (1.9%) had breastfeeding and formula, and two patients had (3.8%) formula and cow milk. Methods of postoperative feeding are shown in figure 1.

30 minutes in one patient (2%). The postoperative feeding problems are demonstrated in Table 3.

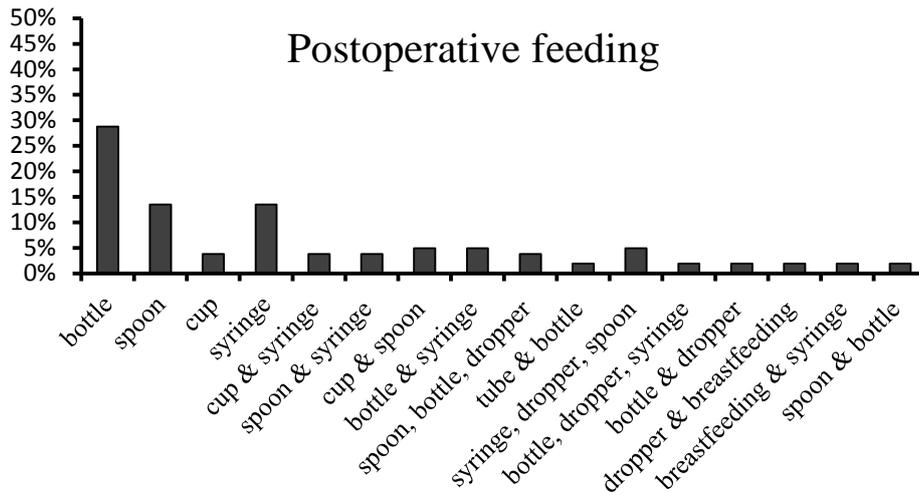
**Table 1- preoperative feeding problems**

<b>Feeding Problems</b>	<b>Frequency</b>	<b>Percent</b>
Sucking disability	7	11.5
Regurgitation sneeze	10	16.4
Sucking disability and regurgitation sneeze	17	27.9
Regurgitation sneeze and maternal disability for breastfeeding	1	1.6
Sucking disability and lack of maternal desire for breastfeeding	1	1.6
Lack of maternal desire for breastfeeding and other problems	1	1.6
Sucking disability and other problems	1	1.6
Regurgitation sneeze and other problems	5	8.2
Other problems	8	13.1
No problem	10	16.4

**Table 2- Preoperative feeding problems in children with supplementary feeding**

<b>Feeding problems</b>	<b>Frequency</b>	<b>Percent</b>
Regurgitation	17	44.7
Low food intake	1	2.6
Long duration of feeding time	1	2.6
Regurgitation and long duration of feeding time	5	8.2
Low food intake and long duration of feeding time	3	7.9
Low food intake and regurgitation	6	15.8
Low food intake and regurgitation and long duration of feeding time	1	2.6
No problem	4	6.6

**Figure1: Methods of postoperative feeding**



**Table 3- Preoperative feeding problems in children with supplementary feeding**

Feeding problems	Frequen cy	Percent
Regurgitation	20	38.5
Regurgitation sneeze	2	3.8
Low food intake	6	11.5
Long duration of feeding time	1	1.9
Low food intake and regurgitation	2	3.8
Low food intake and long duration of feeding time	1	1.9
Long duration of feeding time and regurgitation	2	3.8
No problem	18	34.6

**Discussion**

The growth and feeding problems in children with cleft lip and palate were first noted in 1619 by Dacopendent<sup>4</sup>. Breastfeeding is beneficial for children with cleft lip and palate for prevention of otitis media, speech development, and growth<sup>12</sup>. Trenouthet al.<sup>6</sup> reported 12 children in

whom breastfeeding was tried but was not successful. The study by Gopinath and colleagues<sup>5</sup> demonstrated that among 88.2 percent of mothers trying to breastfeed their infants only 40 percent were successful. In our study the rate for attempt at breastfeeding was 77 percent among them 21.3 percent were only successful for a few days and then it was discontinued. The most

common type of postoperative feeding was by formula reported by 63.5 percent. Many authors believe that cleft lip is not so bothersome for breastfeeding and mainly those with extensive cleft palate or simultaneous cleft lip and palate may have some problems<sup>13</sup>. In our study among patients who only had a cleft lip, in the preoperative phase, seven out of ten children were breastfed.

Among the breastfeeding problems in children with cleft palate and lip, inability to develop effective suction, maternal inability for correct breastfeeding and child positioning and nasal regurgitation should be mentioned<sup>4, 5</sup>. In our study, in the preoperative phase, most mothers complained of sucking inability of their child and nasal regurgitation. This is similar to findings of Reid et al<sup>14</sup>. In the postoperative phase, nasal regurgitation was still the most common problem probably due to inadequate correction of some parts of the cleft and the need for reoperation. Some studies have recommended use of palate plates for closure of cleft palate and negative pressure production<sup>7</sup>. Some studies have declaimed increased feeding rate and shortened feeding time by these plates. However some studies have reported no efficacy regarding these plates<sup>2, 6</sup>. In the current study among four users of these kinds of plates, two had improvements.

The most common feeding route in the preoperative phase was by special bottles seen in 69.5 percent of children among them 85 percent improved. The orthodontic bottles were the most common used bottles. Trenouth et al reported more use of Haberman bottles and reported good efficacy for them<sup>6</sup>. In our study, the bottle was the most common method at the postoperative phase and after that the spoon and syringe were the most common reported tools.

The long duration of feeding time was one of the problems in children with cleft palate and lip leading to early fatigue and excess energy consumption. Clarren et al reported the time of feeding between 45 and 90 minutes and the authors suggested the optimal time to be less than 30 minutes<sup>7</sup>. In the current study, 14.3 percent reported feeding time more than 30 minutes but it was reduced to only one case in the postoperative phase. After complementary feeding initiation the most common feeding problem was nasal regurgitation reported by 44.7 percent of our cases.

Before operation the weights for age was on fiftieth percentile in 11.7 percent of cases showing the appropriate weight for age, but 30 percent and 5 percent were under and above the appropriate weight for age, respectively. 36.7 percent and 16.7 percent were between fifth and fiftieth percentile and fiftieth and ninety-fifth percentiles, respectively. In the postoperative phase, only, 3.9 percent had appropriate weight for age. But 25.5 percent and 3.9 percent had lower and upper than normal weights. Also 49 percent and 17.6 percent were between fifth and fiftieth percentile and fiftieth and ninety-fifth percentiles, respectively. In the study by Mehkarkaret al.<sup>15</sup> six months after operation, the weight for age was 91 percent in postoperative phase and 24 percent in preoperative stage. In some studies the growth reached a normal rate after surgical repair<sup>4</sup> and in others<sup>11</sup> the children with cleft palate and those with syndromes had the most growth deficits and less weight and height. In our study the mean preoperative and postoperative weights were 7.56 and 9.89 kg, respectively with significant difference ( $P=0.001$ ). It demonstrates the positive role of surgery on increasing the weight in children with cleft palate and lip.

The most important limitations to our work were lack of cooperation of parents for follow-up visits. However this was reduced with repeated follow-up phone calls and explanation of the importance of follow up to the parents. Regarding the collection of data by questionnaire, some deficits were present in anthropometric data (such as height at birth and at admission and head circumference). Also follow-up calls were not possible in some cases due to problems such as family transition to another residential region, off status of the phones, etc; leading to decreased sample population. Additional studies with more cases and more objective outcomes are needed in order to come to definite conclusions.

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