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Alimentação da criança no pós-operatório imediato de palatoplastia: comparação entre as técnicas  
utilizando copo e colher

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# Feeding children in the immediate perioperative period after palatoplasty: a comparison between techniques using a cup and a spoon\*

ALIMENTAÇÃO DA CRIANÇA NO PÓS-OPERATÓRIO IMEDIATO DE PALATOPLASTIA: COMPARAÇÃO ENTRE AS TÉCNICAS UTILIZANDO COPO E COLHER

ALIMENTACIÓN DEL NIÑO EN EL POST OPERATORIO INMEDIATO DE PALATOPLASTÍA: UNA COMPARACIÓN ENTRE LAS TÉCNICAS UTILIZANDO VASO Y CUCHARA

Armando dos Santos Trettene<sup>1</sup>, Cleide Carolina da Silva Demoro Mondini<sup>2</sup>, Ilza Lazarini Marques<sup>3</sup>

## ABSTRACT

This prospective study conducted at the Hospital for the Rehabilitation of Craniofacial Anomalies aimed to compare the best technique – a cup or a spoon – for feeding children immediately after palatoplasty. We assessed 44 children and their caregivers during feeding every 4 hours; this generated 176 evaluations: 88 using a cup and 88 using a spoon. The Fisher exact test and the Mann-Whitney test were used for statistical analysis, with a significance level of 5% ( $p < 0.05$ ). When the spoon was used, the percentage of patients with food escaping through the labial commissure was lower (17%;  $p = 0.024$ , the portion administered was higher (12%;  $p = 0.029$ ), and coughing was less frequent (13%;  $p = 0.026$ ) compared with use of a cup. We conclude that using a spoon to administer food after palatoplasty is better than using a cup.

## DESCRIPTORS

Cleft palate  
Surgery  
Feeding methods  
Self care

## RESUMO

Estudo prospectivo realizado no Hospital de Reabilitação de Anomalias Craniofaciais, com o objetivo de analisar comparativamente a melhor técnica para alimentar a criança no pós-operatório imediato de palatoplastia: utilizando copo ou colher. Foram acompanhados 44 crianças e seus cuidadores durante a alimentação, em 4 horários consecutivos, gerando 176 avaliações, 88 utilizando copo e 88 a colher. Os testes Exato de Fisher e de Mann-Whitney foram usados para análise estatística, com nível de significância de 5% ( $p < 0,05$ ). O escape de alimento pela comissura labial foi menor ( $p = 0,024$ ; 17%), o volume administrado foi maior ( $p = 0,029$ ; 12%) e a tosse foi menos frequente ( $p = 0,026$ ; 13%) com a técnica que utiliza a colher. Conclui-se que a técnica de administração que utiliza colher para a alimentação pós-palatoplastia é melhor que a que utiliza o copo.

## DESCRIPTORES

Fissura palatina  
Cirurgia  
Métodos de alimentação  
Autocuidado

## RESUMEN

Estudio prospectivo desarrollado en el Hospital de Rehabilitación de Anomalías Cráneo-faciales, con el objetivo de evaluar comparativamente la mejor técnica para alimentar al niño en el post-operatorio inmediato de palatoplastía, utilizando un vaso y una cuchara. Se realizó el seguimiento a 44 niños y sus cuidadores durante la alimentación, en cuatro horarios consecutivos, lo que generó 176 evaluaciones, 88 utilizando un vaso y 88 una cuchara. Para el análisis estadístico, se utilizaron las pruebas Exacta de Fisher y de Mann-Whitney, con un nivel de significancia del 5% ( $p < 0,05$ ). El escape de alimento por la comisura labial fue menor ( $p = 0,024$ ; 17%), el volumen administrado fue mayor ( $p = 0,029$ ; 12%) y la tos fue menos frecuente ( $p = 0,026$ ; 13%) con la técnica que utiliza la cuchara. Se concluye que la técnica de alimentación post-palatoplastía con cuchara es mejor que la que utiliza el vaso.

## DESCRIPTORES

Fissura del paladar  
Cirugía  
Métodos de alimentación  
Autocuidado

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## INTRODUCTION

Craniofacial deformities affect a wide and complex group; they include isolated or multiple anomalies that have genetic and nongenetic causes and affect around 5% of live births. Cleft palate is a nonsyndrome malformation that commonly affects the craniofacial region<sup>(1-2)</sup>.

Reconstructive surgery to a child born with a cleft palate represents both aesthetic and functional challenges<sup>(3-4)</sup>. Palatoplasty is one of the main types of reconstructive plastic surgery performed during the long and complex treatment course for cleft palate<sup>(5)</sup>. The Hospital for the Rehabilitation of Craniofacial Anomalies of the Universidade de São Paulo (HRAC-USP, acronym in Portuguese) is a national and international referral center for rehabilitation process in patients with orofacial clefts and related anomalies. At our hospital, palatoplasty is performed at the minimum age of 12 months.

Feeding children with labiopalatal cleft is the main concern of parents and caregivers from prenatal diagnosis or after birth<sup>(6-8)</sup>. This concern seems to be alleviated after birth but is rejuvenated upon palatoplasty, mainly because of the anatomic localization of the procedure (oral cavity) and because the child has already established a feeding routine and developed food preferences.

Concerns related to feeding comprise the main focus of nursing care in the postoperative period. According to the HRAC-USP protocol, nutrition among children who have had palatoplasty must be in a liquid form and served cold, should be provided in this form for 30 days, and should not be administered with a bottle or nozzle. Nutritional standards interfere significantly in the postoperative recovery process, which, in turn, is related to healing process and infection prevention<sup>(8-9)</sup>.

The established minimum age for palatoplasty at HRAC-USP agrees with the physiologic period during which use of cups and spoons has already begun. These implements are recommended beginning at six months of age, a period when oral skills are physiologically mature<sup>(8,10-11)</sup>.

Cup and spoon constitute the most simple and inexpensive methods for feeding. They have several advantages, such as low infection risk, promotion of positive oral experience, increased comfort compared with other methods, increased bond between the caregiver (who participates in feeding the patient) and the child, less energy expended than bottle feeding, reduction in fatigue and weight loss, increases in saliva production and digestive enzymes by stimulating oral receptors (which results in more efficient swallowing), and promotion of mandible, tongue, and facial muscles movement<sup>(8)</sup>.

After palatoplasty, providing efficacious and successful education related to feeding constitutes the biggest challenge for health care providers<sup>(12)</sup>. Children who have undergone palatoplasty must be discharged when they achieve the standard for food acceptance, and parents should also be ready to assume the tasks needed for the child's postoperative care<sup>(13)</sup>.

Rehabilitation of patients with labial cleft must involve interdisciplinary care that prioritizes biopsychosocial and functional results. Nurses play a fundamental and essential role in all phases of rehabilitation, acting mainly to create care protocols to serve as the basis for scientific evidence.

The scientific community, parents, and families are often concerned about the best technique for feeding children after palatoplasty. Other areas of concern include continuity of care, prevention of complications, and therapeutic success. To our knowledge, no studies in the literature have compared using a cup and a spoon to feed children after palatoplasty. The lack of such a study demonstrates the relevance of the current research.

We aimed to determine the best technique for feeding children in the immediate postoperative period (IPP) after palatoplasty by comparing the use of a cup and a spoon.

Concerns related to feeding comprise the main focus of nursing care in the postoperative period.

## METHODS

Prospective, cross-sectional study of a quantitative approach conducted at the admission unit of the HRAC-USP from August to November 2010.

### Population

The study population consisted of children in the IPP after palatoplasty and their caregivers. The sample included 44 binomials evaluated in four consecutive moments, which generated 176 evaluations. Of them, 88 were related to food administered with a cup and 88 with a spoon.

Inclusion criteria for children were as follows: palatoplasty with or without associated otology microsurgery; palatoplasty IPP; no surgical complications, such as excessive bleeding and need for surgical revision; care provided by mother, father, or legally responsible adult; and age 11 to 18 months old.

We excluded children with neuropsychomotor compromise, a genetic syndrome, or clinical or other malformations or comorbid conditions that could change the patient's general status. To stratify exclusion criteria, we reviewed medical records of the pediatric, neuropsychiatric, and genetic units.

Children and their caregivers were evaluated during four consecutive feeding times that involved use of the cup and the spoon techniques.

## Instrument for Data Collection

To improve data collection, we split the instrument used to gather data into three different parts (A, B, and C). In the first part, the child was characterized according to sex, age, and cleft type<sup>(14)</sup>. The second part consisted of three items and aimed to identify surgical variables. This part was completed by reviewing the medical record—more specifically, the fields that described the surgery and in the anatomic localization used (that is, palatal region and presence of liberal incision with or without buffer). These data were compared with the other information obtained to standardize the final results evaluating their relationship with study variables.

Part C was related to the food administration technique; use of cup or spoon was noted by directly observing the caregiver and child. Observations were recorded by using a protocol composed of twelve items related to the technique and other variables, such as the caregiver's difficulty in positioning the child, episodes of coughing and choking, food escape by labial commissure, time spent administering food, amount of food accepted by the child, and confidence reported and observed by caregiver. In addition, we sought to identify the technique used for feeding each child before surgery and the presence of injury on the unilateral or bilateral labial commissure because these could interfere with the food administration method.

We used a disposable 50-ml cup and a steel dessert spoon (7.5 ml on average). The amount of food administered was verified by measuring (graduation) of the cup in a 200-ml disposable vessel made available by the nutritional service. This type of measurement was considered more convenient because when caregivers offer food using a spoon, they are not adequately controlling the volume; often they administer a greater amount (full spoon) or a smaller amount (half of the spoon).

## Ethical Procedures

This study was approved by the Ethical and Research Committee of the Hospital for the Rehabilitation of Craniofacial Anomalies of the Universidade de São Paulo (protocol number 177/2010-SVAPEPE-CEP). All participants signed the consent form according to guidelines of resolution 466/2012 of the National Health Council for research with human subjects.

## Data Collection

Caregivers were educated by researchers on food administration technique using the cup and the spoon during nursing preoperative consultation or, when that was not possible, during the perioperative period. Data collection using instrument part A was done at this time.

According to HRAC-USP protocol, during the IPP, food is offered to children every three hours (at 8 a.m., 11 a.m., 2 p.m., 5 p.m., 8 p.m., 11 p.m., 2 a.m., and 5 a.m.). During

all these times, caregivers are assisted by the nursing team, following established protocols by the nursing service on techniques and assistance related to child feeding.

During four consecutive times, the caregiver intercalated the food administration using the cup and the spoon; these techniques were used exclusively so that this study could evaluate them. At this time, data collection using instrument part C was performed. Assessment was performed four times to avoid possible interference during technique evaluation, such as pain, agitation, and caregiver initial anxiety. To avoid bias, the same researcher did all evaluations.

Times to conduct evaluation were defined after surgery and fasting discharge, which usually occurred at night (8 p.m., 11 p.m., 2 a.m., 5 a.m.).

Data collection using instrument part B occurred before the first evaluation of the food administration technique.

## Data Interpretation

To better define the technique related to food administration after palatoplasty (using a cup or a spoon), the following criteria were applied: more food accepted during a shorter time, less escape of food by labial commissure, fewer episodes of coughing and choking, less difficulty positioning the child by the caregiver, and more confidence reported and observed by caregiver.

To create a database, we used Microsoft Excel 2003 (Redmond, Washington). The Fisher exact test was used for analyzing significance of differences between paired samples. For nonparametric analysis, the Mann-Whitney test was adopted. A  $p$  value  $<0.05$  (5%) was considered to represent a statistically significant difference.

## RESULTS

The number of boys and girls was equal (50%,  $n=22$ ). The most predominant age was 12 and 13 months (56.81%,  $n=25$ ). The most common cleft, based on incisive forame<sup>(14)</sup>, was the unilateral cleft (59.08%,  $n=26$ ). Bottle-feeding was more commonly used for food administration at home (59.09%,  $n=26$ ).

Table 1 describes the frequency distribution related to variables relating to use of cup and spoon: adequate position of the caregiver, episodes of coughing and choking during food administration, food escaping by commissure, and confidence reported and observed by caregiver.

## Fisher exact test

Of variables studies, when the spoon was used, fewer patients had food escaping by labial commissure (17%;  $p=0.024$ ). For time for food administration, a significant difference was seen between the technique using the spoon and the technique using the cup (12%;  $p=0.029$ ) (Table 2).

**Table 1** – Frequency distribution of techniques evaluating the cup and the spoon in relation to variables observed – Bauru, SP, 2011.

		Yes		No		Total	p
		N	%	n	%		
Caregiver's difficulty positioning child as requested	Cup	28	32	60	68	88	1.000
	Spoon	27	31	61	69	88	
	Total	55	31	121	69	176	
Difficulty positioning the child using the requested technique	Cup	28	32	60	68	88	1.000
	Spoon	28	32	60	68	88	
	Total	56	32	120	68	176	
Coughing episodes during food administration	Cup	4	5	84	95	88	0.121
	Spoon	0	-	88	100	88	
	Total	4	5	172	95	176	
Choking episodes during food administration	Cup	5	6	83	94	88	0.211
	Spoon	1	1	87	99	88	
	Total	6	3	170	97	176	
Food escaping by the commissure	Cup	67	76	21	24	88	0.024*
	Spoon	52	59	36	41	88	
	Total	119	68	57	32	176	
Caregiver showed confidence	Cup	62	70	26	30	88	0.867
	Spoon	64	73	24	27	88	
	Total	126	72	50	28	176	
Caregiver reported confidence	Cup	61	69	27	31	88	1.000
	Spoon	60	68	28	32	88	
	Total	121	69	55	31	176	

\* Significant association (p<0.05)  
Fisher exact test

**Table 2** – Volume distribution (ml) in feeding children in immediate postoperative period after palatoplasty with cup and spoon – Bauru, SP, 2011.

	Mean	SD	Δ%	Median	Minimal	Maximum	P
Cup	144,773	60,420	12	140,000	50,000	400,000	0.029*
Spoon	161,705	51,354		150,000	80,000	300,000	

Δ% average percent increase in volume administered with spoon.

\* Statistically significant difference (p<0.05)  
Mann-Whitney test

**Table 3** – Evaluation distribution of use of cup and spoon related to anatomic localization of surgical procedure and the variable episode of coughing during feeding – Bauru, SP, 2011.

Anatomic localization of surgical procedure		Coughing episodes during feeding				P
		Yes		No		
		N	%	N	%	
Previous palatoplasty	Cup	–	–	12	7	1.000
	Spoon	–	–	12	7	
	Total	–	–	24	14	
Posterior palatoplasty	Cup	1	1	29	16	1.000
	Spoon	–	–	30	17	
	Total	1	1	59	33	
Total palatoplasty	Cup	6	3	40	23	0.026*
	Spoon	–	–	46	26	
	Total	6	3	86	49	

\* Significant association (p<0.05)  
Fisher exact test

We attempted to relate food acceptance with use of cup and spoon to surgical variables: anatomic localization (previous, total, or posterior palatoplasty), presence or absence of associated otology microsurgery, presence of unilateral or bilateral liberating incision and presence of buffer. A statistically significance difference was seen in the association of food administration technique using a cup and episodes of coughing during feeding (13%; p=0.026 only in patients who underwent total palatoplasty (Table 03).

## DISCUSSION

### Patient Characteristics

The even divide of boys and girls among our study patients could be explained by the inclusion criteria, in particular because we approached only children with trans-incisive and postincisive foramen fissure. In the literature



the isolated palatal cleft is more common in female patients and the labial palatal cleft with or without palate involvement is often found in males<sup>(15-16)</sup>.

The HRAC-USP protocol establishes that palatoplasty should be done at age 12 months; the ages of the children in our study shows the adherence to this recommendation. The palatoplasty performed at the appropriate age contributes to many different aspects of the success of rehabilitation in children with labial palatal cleft<sup>(5,17)</sup>.

In relation to fissure classification based on incisive foramen<sup>(14)</sup>, there was a prevalence of unilateral cleft group, which corroborates with literature<sup>(15)</sup>. At HRAC-USP in group, children classified with incisive transforamen undergo the primary surgeries at two ages: cheiloplasty at three months of age and palatoplasty at 12 months of age<sup>(5)</sup>.

### **Utensils Used for Food Administration**

Palatoplasty is among the more invasive primary surgical procedures and can make it difficult for children to accept food in a satisfactory manner; this results in higher ponderal loss<sup>(13,18)</sup>. This aspect itself justifies the performance of this study, which aimed to define the best technique for food administration after palatoplasty, considering its direct relationship with food acceptance. Feeding children in the postoperative period is difficult, and initially the caregiver should be not the only responsible, especially because the caregiver is often emotionally distressed<sup>(13)</sup>.

Parents reported using bottle feeding before surgery. This result is understandable because normally children with cleft palate are feeding with bottles<sup>(8,12,19)</sup>. Although bottle feeding is acceptable after cheiloplasty, its use after palatoplasty is controversial<sup>(18,20)</sup>. The HRAC-USP surgical protocol contraindicates the use of bottles in the postoperative period.

For this reason, the children exposed to a cup or spoon before the surgery may accept this technique more easily in the postoperative period. It is well known that adequate food acceptance interferes directly in hydration and nutrition of the child, in particular during postoperative recovery. It also results in lower ponderal loss and lower risk of complications, besides reducing stress in children and caregiver. Discontinuation of bottle-feeding before surgery is defended in the literature<sup>(3,19,21)</sup>.

On the other hand, a study<sup>(22)</sup> that evaluated the nutritional status of children who underwent palatoplasty and were fed with a bottle or spoon concluded that children previously fed with a bottle had higher ponderal gain. However, that study included only patients who had posterior palatoplasty.

A prospective and randomized study<sup>(20)</sup> composed of 82 children in the IPP after palatoplasty evaluated effects of bottle, spoon, cup, or syringe feeding on surgical complications (oroantral fistula and surgical dehiscence), use of

sedatives, oral ingestion in the first six days, and relative weight gain in first and second months. The authors concluded that bottle feeding did not lead to adverse effects<sup>(20)</sup>. However, this same study emphasized that during first three days, the group fed with spoon, cup, or syringe ingested more food and used fewer sedatives. They also found that pain was a limiting factor for children who needed to use vigorous suction with the bottle; this variable was also related to lack of oroantral fistula formation and surgical dehiscence. Although the amount of food accepted was higher six days after palatoplasty, benefits of cup, spoon, and syringe use were evident in the IPP.

Another study<sup>(18)</sup> conducted during the postoperative period after cheiloplasty and palatoplasty randomly assigned 80 children to feeding with a probe, syringe, breast-feeding, or bottle-feeding. The investigators reported no significant differences in nutritional, immunologic, or psychological outcomes. However, this study did not compare feeding techniques using a cup and a spoon.

The use of probes for feeding children is unnecessary and forbidden by HRAC-USP because of the presence of neurologic reflexes in most children; however, this method of feeding can be considered in the rare children with syndromes or dysphagia<sup>(21)</sup>. The use of conventional methods, including probes, results in stress and irritation in both children and caregivers<sup>(18)</sup>. It is important to mention that vomiting is often observed in the IPP because of blood intake and anesthesia used during the surgery. This condition, however, is transitory and does not prevent the start of oral feeding.

The use of syringes to feed children is contraindicated at HRAC-USP because of difficulty in handling, the possibility of trauma to the surgical incision, and the high cost. In addition, the use of syringes, probes, and drop dispensers to feed children with cleft palate has become outdated, and continued use of these methods is associated with lack of information<sup>(19)</sup>.

Breastfeeding must be always encouraged, but most surgeons discourage this practice in the IPP after palatoplasty. The use of bottle feeding and direct breastfeeding is contraindicated in the HRAC-USP protocol, except under the specific advice of the surgeon. This recommendation aims to avoid possible traumas in surgical incision related to suction, which could also interfere in the healing process. The cup and the spoon represent alternatives for feeding management, and this study reinforces their importance during the IPP after palatoplasty. In addition, these methods are simple, practical, and inexpensive and present lower risk of contamination.

Discontinuation of bottle feeding at the appropriate time can reduce dental, phonoarticular, and muscles problems<sup>(19)</sup>. For dental problems it is necessary to emphasize the importance of oral health for adequate surgical rehabilitation in patients with labial palatine cleft, especially because this

constitutes a pre-requisite to perform the reparative surgeries. Cessation of bottle feeding after surgery is associated with improved oral health because palatoplasty represents only the beginning of the rehabilitation process.

### **Children's Responses to Feeding with the Cup and Spoon**

It was evident that with spoon use, less food escaped through the labial commissure and more food was accepted. When the cup was used, caregivers found it difficult to control the amount of food administered. Although both techniques pour the volume into the oral cavity, using a spoon permitted the caregiver to divide the amount of food into small quantities (roughly 7.5 ml), which enabled the propulsion of food and reduced losses.

We found that coughing episodes were less frequent when food was offered using the spoon in children who underwent total palatoplasty; this surgical procedure involves a greater amount of manipulation and as a result is more painful. Pain limits food acceptance because the child, although hungry, is reluctant to ingest the food in an efficient way. As a result food accumulates in the oropharynx and predisposes toward coughing.

Crying is common after this type of surgery; it could also be related to the difficulty in coordinating swallowing and breathing. Such difficulties also may lead to coughing. Tracheal intubation can increase pain, and the development of postextubation laryngitis often leads to coughing. In addition, a child submitted to tracheal intubation has difficulty swallowing. Another potential reason for coughing in this group is related to flow. This is higher with a cup and can increase the risk for choking and coughing, situations that affect food propulsion negatively.

Among the benefits of administering food with a spoon are the greater oral stimulation spoons provided compared with cups, which enables muscle contraction and stimulates nerve endings<sup>(8,19)</sup>.

### **CONCLUSION**

Our results indicate that when a spoon was used, food less frequently escaped through the labial commissure, more food was accepted, and children who underwent total palatoplasty had fewer coughing episodes during feedings. These findings show that in the IPP after palatoplasty, using a spoon to administer food seemed to be a better choice than using a cup.

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