

## TREATING CHILDREN WITH PERSISTENT ARTICULATORY PROBLEMS USING INDIVIDUALLY DESIGNED PALATAL PLATES AD MODUM CASTILLO-MORALES

Anita McAllister, speech pathologist & Martha Björnström, doctor of dental surgery  
Dept. of Speech Pathology, Danderyd Hospital, S-182 88 Danderyd, Sweden.  
Ph +46 8 655 58 11, FAX +46 8 622 58 57.

### Abstract

In an attempt to evaluate treatment with palatal plates for children with primarily articulatory dysfunction 20 children were treated. Each child got at least one follow-up appointment after a period of two to three months. Fourteen children had improved articulation at their first check-up after 3 months. The palatal plate intensified the exercise program and led to more rapid results.

### INTRODUCTION

Persistent articulatory problems have long been a challenge to most speech pathologists working with children. Despite substantial effort on both parts the problem may still remain. During the last two decades this group of patients have received increasing attention and their special types of difficulties has been studied by several researchers, for example [1, 2, 3]. Different therapy techniques have also been described usually involving simple oral motor exercises with increasing complexity as the treatment proceeds, [4] The

### METHOD

Twenty children participated in the investigation, 6 girls and 14 boys. The mean age when starting their treatment with the palatal plate was 8,4 years with a standard deviation of 3,58 years ranging from 5,0 - 16,0. All children had an history of previous

term verbal apraxia was proposed by Morley, [5]. A generally accepted definition of the problem is that it is a neurological disorder affecting speech production without any overt motor or sensory paralysis

In our clinic an intraoral treatment with a palatal plate or a vestibular brace has been one possible method of treating children with persistent articulatory problems. The method was originally established in order to improve the rehabilitation of patients with oral motor problems due to trauma or stroke. The purpose of the plate was initially to induce and facilitate swallowing and the method has been described by dental surgeon Selley, [6]. The concept of intraoral treatment devices with a more wide spread use has also been proposed by Dr. R Castillo-Morales, [7] this has also been described by Hoyer and colleagues, [8, 9].

The purpose of the present investigation was to evaluate the treatment of palatal plates for children with articulatory problems.

treatment by speech pathologists or therapists based on various methods. A thorough evaluation was made including both sensory and motor tasks. The sensory test included tasks such as identifying two tactile stimuli on the tongue with varying inter stimulus distance. The motor task was mainly imitation of simple oral

movements, like blowing and sucking. Articulatory tasks involved single sound production and monosyllabic words (CV) to establish possible difficulties with certain articulatory targets. Dynamics were tested with sequences of sounds like /lalalala/ or /titiiti/. The ability to change place of articulation was tested with a sequence of /patakatakatakata/. Auditory discrimination was tested in order to establish if this disability was part of the problem complex. A speech sample was collected. This involved an informal interview with the patient and for those with reading skills a short text. Frequently the oral motor problem is combined with other difficulties such as comprehension difficulties, general sequencing difficulties, problems with eating or sucking and voice problems. Children with oral dyspraxia are not aware of the exact position of their articulators. Often they have to check the result with their hands or in a mirror. We also found a tendency for dyspractic children to overdo the exercises involved in the test. None of these children had any substantial problems involving mimic muscles or auditory discrimination although dynamics - rapid movements of the tongue - was often part of their problem complex. Eight children had problems with the sensory feedback from the tip of the tongue as tested with two stimulator at different distances.

Prior to the treatment with a palatal plate 19 children participated in a regular treatment program for an average of 5 months. This program involves oral exercises with lips, tongue and soft palate, vibration stimulation as well as oral exercise with resistance, simple articulatory tasks and exercises involving the mimic muscles.

Five children had problems mainly concerning /r/. The aim of their plate was to reinforce the stimuli of the articulatory place for the tongue when producing /r/. Ten children had problems mainly involving the upper lip and the tip of the tongue. A palatal plate was made to stimulate the tongue and normalize the mobility of the upper lip.

Three children dentalized the velar sounds /k, g/ and two children had a lateral /s/-articulation. One of these children also had a palatalized articulation of /l/.

The palatal plates were individually designed to train each child's specific articulatory deficits. The palatal casts were made in an upright position to avoid breathing difficulties and the possible feelings of panic. Each child got at least one follow-up after a period of 2,5 - 3 months. Improvements led to alterations of the palatal plates or a termination of treatment.

### RESULTS

The evaluation of treatment results was made by the authors in collaboration with the parents and patients at each follow-up. It was documented with video or photography.

In the first group two children succeeded in establishing a trilled [r]. One mother reported that the [r] was established after using the palatal plate for a period of only 10 days. The other 3 had all succeeded in producing an acceptable [ʀ] at the time of the first or second control. This is a sound that is accepted as /r/ in standard Swedish.

N	Norm	Improve	No change
/r/ 5	2	[ʒ] 3	
/t,d,n/ 10	3	7	
/k,g/ 3		2	1
/l,s/ 2		1	1
Tot	5	13	2

Table 1. Results at the first and/or second check-up after 2,5 - 3 and 6 months of treatment respectively. None of the problems got worse.

Three patients in the second group had normalized their dental articulation and treatment have thus terminated. Seven children had improved articulation meaning that the velar articulation was more palatalized or retroflexed

In the third group 2 children improved their articulation but no one was normalized. One child had not changed the place of articulation and still dentalized all velar stops.

The two children in the fourth group had problems with lateral /s/ and the l-sound. The child with difficulties articulating l improved his articulation. However he did not use the edge of the tongue but rather had the tongue a little bit interdental when articulating l, thus it could not be considered to be normalized. The lateral s articulation still remained at the time of the first check-up for both children.

All patients in this study could adapt to the regular use of an intraoral device.

#### Discussion

The palatal plates are used to strengthen the intraoral sensory feedback when that is necessary. It

gives the child a clear target to aim at. The use of a palatal plate does not put the same demands on the parent as a regular exercise program. The patient and the plate do the work by themselves. This is invaluable in patients with long treatment periods. For the patient this means a possibility to decrease the time spent with the speech pathologist in the clinic. This can be invaluable for this group of patients who all have had extensive speech therapy.

Many patients with oral motor problems may also have eating and chewing difficulties. In our group of patients this could not be noticed. However in their case history chewing and eating difficulties had taken place at some point for 6 patients.

In our project all patients could adapt to the use of an intraoral device. This is in good agreement with previous studies that report good results with very young children often not a year of age [7, 8, 9]. Needless to say the aim of these plates have not primarily been articulation but rather eating, sucking and reduced drooling for example.

A positive side effect of the plate for some children hypersensitive in the back of the mouth has been facilitated tooth brushing of the back molars. We have also noted positive psychological effects when the patients themselves note the improved articulation.

#### Conclusion

- Children with articulatory problems treated with a palatal plate should not have difficulties with auditory discrimination.

- A palatal plate can help establish the place of articulation for different phonemes by strengthening the stimulation of the articulatory target.

- It was easier to adapt to a regular use of the palatal plate than to establish regular habits with articulation exercises.

- The palatal plates seemed to intensify treatment and lead to more rapid results.

#### References

- [1] Ferry PC, Hall SM, Hicks JL. (1975). "Dilapidated" Speech: Developmental Verbal Dyspraxia. *Develop Med Child Neurol*, 17, 749-756.
- [2] Prichard CL, Tekieli ME, Kozup JM. (1979) Developmental Apraxia: Diagnostic Considerations. *J of Com Dis*, 12, 337-348.
- [3] Amorosa H, von Benda U, Wagner E. (1990). Voice Problems in Children with Unintelligible Speech as Indicators of Deficits in Fine Motor Coordination. *Folia Phon*, vol 42, pp64-70.
- [4] Bashir AS, Graham Jones F, Bostwick RY. (1984). A touch-cue method of therapy for developmental verbal apraxia. *Seminars in Speech and language* 5, 2, 127-137.
- [5] Morley MF: (1965). The Development and Disorders of the Speech in Childhood. 2nd ed, Williams and Wilkins, Baltimore.
- [6] Selley W G. (1985). Swallowing difficulties in stroke

patients: a new treatment. *Age and Ageing* 14, 361-365.

[7] Castillo-Morales R. (1989). *Orofasciale regulationsterapie*. Pflaum Verlag, München.

[8] Hoyer H, Limbrock G J. (1990). Orofacial regulation therapy in children with down syndrome, using the methods and appliances of Castillo-Morales. *J of dentistry for children*, Nov. - dec.

[9] Limbrock G J, Hoyer H, Scheying H. (1990). Drooling chewing and swallowing dysfunction in children with cerebral palsy: Treatment according to Castillo-Morales. *J of dentistry for children*, Nov. - dec.