



Appliance for chronic drooling in cerebral palsy patients

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A mother writes: "My son Austin is an adorable 13-year-old child, who has an unfortunate problem: drooling. I can't even begin to express the social bummer that this can be. I could not understand why people just would not look past a little drool. Well, alright, maybe a lot of drool. Maybe even sometimes it hung from his lower lip like a long spider web. Often there was a wide wet spot on his shirt just below his chin. During the winter, we had seen this area freeze. Not a pleasant situation. This has been a difficult obstacle to overcome for Austin."¹

These words are from an article in *Exceptional Parent* written by the mother of a young man with cerebral palsy who is a patient in the dental clinic at Texas Scottish Rite Hospital (TSR) in Dallas, Texas.

Most of us, as pediatric dentists, take for granted that many children with cerebral palsy drool due to abnormal oral motor function, which results in decreased or ineffective swallowing patterns. However, we may not be fully aware of the level of social stigma drooling causes for these children and their families. Many parents go to great lengths to help their children. Austin's mother continues "I decided to buy colored bandanas for him to wear around his neck that would coordinate with all his clothes, thinking that this might help protect the clothes and hide any staining. My husband and I became very selective when purchasing clothes for Austin. We would give it the "drool test". By hiding behind a rack of clothes in the store, using a spray bottle from my purse, we would add a few drops of moisture to the garment; a quick check to see how the garment might look after being worn by Austin for a few moments."¹

Austin is our favorite success story with a device that helped him control his drooling and helped him give up his bandanas.

In the 1970s, Castillo-Morales developed a removable activating palatal plate with a button in the palate which was used in patients with cerebral palsy to facilitate swallowing and decrease drooling.² A modification of this appliance which used a movable bead rather than a button has been used for years at Riley Children's Hospital in Indianapolis, Indiana, for drooling in cerebral palsy patients.³ Their modified appliance has been used in the dental clinic at TSR for the past three years for 12 patients with interesting and encouraging results. The word has spread and parental enthusiasm has precipitated many telephone calls to local dentists, resulting in increased interest recently in the dental community. Therefore the purpose of this manuscript is to describe the appliance and its indications



Fig 1. Intraoral appliance drooling appliance with full palatal coverage, constructed of dental acrylic with wire clasp arms, a labial bow, and a movable rolling bead placed in the posterior aspect of the appliance.

The drooling appliance is very similar to an orthodontic retainer in its design and fabrication. It is an intraoral appliance with full palatal coverage that is constructed of dental acrylic with wire clasp arms and a labial bow (Fig 1). Often, it is necessary to use extra clasps to increase anchorage, particularly when the teeth are only partially erupted.

A movable rolling bead is placed in the posterior aspect of the appliance. The location of the placement of the bead is dependent on the swallowing pattern of the child. It is necessary to have the child swallow and observe the tongue placement during swallowing. Normal tongue position during swallowing is in the midline; however, some children with cerebral palsy may have a shifting of tongue placement to one side or the other due to abnormal muscle function. It is critically important to place the bead so that the tongue will be able to come in contact with it and yet be positioned far back in the throat (Fig 2). Beads can be placed on the side of the palate (Fig 3) or in the middle of the palate (Fig 4), according to the patient's swallowing pattern.



Fig 2. Rolling bead must be placed so that the tongue will be able to come in contact with it and yet be positioned far back in the throat.



Fig 3. Beads can be placed on the side of the palate according to the patient's swallowing pattern.

An impression of the maxillary arch is necessary to create a model for fabrication of the appliance. Taking impressions for children with cerebral palsy may be difficult due to their limited ability to fully cooperate or their uncontrolled movements. Therefore, it is important to fully explain the procedure to the child and to have several practice runs with empty trays to let the child get used to the procedure. Use fast-set alginate and warm water to further increase the speed of set. Appliance fabrication can be processed through any orthodontic laboratory with proper instructions, and a picture of the appliance would be helpful to the laboratory technician.

The protocol for using the appliance is controversial. Some believe that the child should only wear the appliance for limited times during the day, such as in school or in public where drooling is a more significant social problem.

These individuals believe that if the child wears the appliance all the time, he/she will become resistant to the effect. Others believe the child should wear the appliance all the time, and if he/she becomes resistant to the appliance, the bead can be moved to give the tongue a new place to seek. Both approaches have been used for the patients at TSR, and both have seemed to work equally well. One patient did become resistant to the appliance over time and began to drool slightly. A



Fig 4. Bead can be placed in the middle of the palate according to the patient's swallowing pattern.

new appliance was constructed and the bead was moved to the side with good results. There was one very interesting aspect worth reporting about this patient. During the month that the old appliance was out and the new appliance was being constructed, the patient did not resume drooling to the degree he had drooled before the appliance was placed. It is possible that the appliance does retrain the tongue to facilitate long-term improvement in drooling, even without the appliance. However, much more information is needed before such a claim can be made.

One dilemma in the use of this appliance is patient selection. The patients treated at TSR have been eight or older and have all been sufficiently cognitively aware so they could follow directions to swallow on command and be involved in the explanation of the appliance and its purpose. Additionally, they have all been cooperative enough to leave the appliance in place. However, anecdotal reports from others indicate that this level of cooperation may not be necessary and that a fixed appliance can be used successfully in a noncompliant child under 8 years of age.⁴

No attempt has been made to quantify the drooling in these patients or scientifically analyze the outcome of the appliances with respect to type of cerebral palsy, degree of involvement, time of use of appliance, etc. Clearly, more information is needed to clarify the mechanisms explaining the apparent success of the appliance. However, until such information is available, the appreciation of the parents and the successes for the patients encourages us to continue to use this appliance. Austin's mother's words best describe our most treasured outcome. "The school bus arrived to pick Austin up for school. I was scurrying about gathering all his school stuff. As he was headed out the door in his chair I quickly yelled, "Wait Austin, you forgot your bandanas." With a full grin from ear to ear he said, "Mom, I don't need them anymore."¹

References

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