A Thermoplastic Thumb Post for the Treatment of Thumb-Sucking

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Behavioral research has indicated that thumb-sucking often covaries with hair pulling and that the elimination of thumb-sucking can result in the elimination of the hair pulling with which it was associated (e.g., Friman & Hove, 1987; Knell & Moore, 1988). Treatments for persistent thumb-sucking, however, have shown minimal or transient effects (e.g., Christensen & Sanders, 1987; Lichstein & Kachmarik, 1980), are invasive (Moyers, 1969), or require constant supervision by parents (Friman & Leibowitz, 1990). The purpose of this paper is to describe a treatment device designed to eliminate thumb-sucking and associated hair pulling. This device was created by an interdisciplinary treatment team involving a behavioral psychologist and an occupational therapist (the first two authors). This report represents a model case of how occupational therapists, with the use of adaptive devices, can direct or participate in interdisciplinary efforts to promote the emotional and behavioral health and age-appropriate development of children (American Occupational Therapy Association, 1981).

The Problem

The client was a 5-year-old girl with a 3-year history of severe hair pulling that had been unresponsive to various treatment programs. The girl had a large bald spot from this behavior and had at one time pulled out all of her hair. Previous interventions for hair pulling included reward programs, punishment, and response prevention. Direct observations made in the clinic by the first and third authors indicated that hair pulling reliably occurred only in the presence of thumb-sucking and vice versa.

Established treatments for thumb-sucking were then implemented by the first and third authors, including aversive taste treatment, rewards, and monitoring (Friman & Leibowitz, 1990). These treatments failed to completely eliminate thumb-sucking, however, and hair pulling continued. A pediatric occupational therapy consultation was then requested. The occupational therapist (the second author) was asked to fabricate a reliable device that could not be removed by the patient and that would disrupt but not prevent thumb-sucking. The therapist went about the task with three objectives: (a) to devise a splintlike device that would disrupt but not prevent thumb-sucking and that would allow for functional use of the hands, (b) to devise a strapping system that could not be removed without the assistance of another person, and (c) to make the device as appealing as possible to reduce any additional social stigma that the child might feel during the intervention period.

The Device

The device was made out of bright-pink low-temperature thermoplastic material, a color chosen by the client. A loose, circumferential thumb post with a comfortable
web space was formed (see Figure 1). Approximately one half of the distal phalanx of the thumb was left uncovered so that it was possible to oppose each finger and grasp while the device was in place. The thermoplastic material was rolled back slightly at the end point. Only enough material was left over the thenar musculature and dorsum of the hand to provide strap attachment points.

The straps were considered a critical feature of this device, because one request of the initial consult was to create a device that could not be removed by the client. Rivets were used to secure hook and loop touch-fastener straps to the thermoplastic material (see Figure 2). A 1½-in. piece of beaded metal lamp chain was then hand-sewn to the outside of each strap. This was easily secured with double stitches between two or three beads. When fastened, the strap encircled the wrist and rested in the space between the ulnar styloid process and the lateral row of carpal bones (see Figure 3). The strap tension that was necessary to prevent removal of the device by the client was achieved by attaching the lamp chain connector to one side of the chain and trimming the other piece to the length that would reduce all slack. The connectors are extremely difficult to fasten or unfasten with one hand by the child but could easily be removed and replaced by the mother or another adult. The thumb post was worn daily during all activities and was removed contingent on 24 consecutive hours without thumb-sucking. It was immediately replaced if an instance of thumb-sucking was observed.

The Outcome

The device proved extremely effective. Thumb-sucking was gradually eliminated, and as thumb-sucking diminished, so did the hair pulling. The thermoplastic thumb posts were no longer used after 6 weeks, and thumb-sucking and hair pulling did not return. At the 3-month follow-up, effects were maintained and the bald spot had been eliminated. Results were maintained at the 12-month follow-up. In addition to its efficacy, the device has three additional features that make it attractive as a treatment option for thumb-sucking that has proven unresponsive to the type of behavioral treatment initially implemented. First, the device is inexpensive and easy to construct. Second, it is easy to install and monitor. Finally,
it is less invasive than intraoral devices, which are often used as a last resort and require that a dentist insert obtrusive appliances into the client’s mouth. The modified thumb splint created no discomfort, no reduction in adaptive functioning, and no concern on the part of the client’s mother, who was pleased with the device’s appearance and effectiveness.

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References


