Brief or New: A Distal Support Sling for the Hemiplegic Patient

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Occupational therapists are constantly searching for the "ideal" sling, one that would provide proper support for the hemiplegic upper extremity. Every sling has its strengths and weaknesses and should be looked at objectively when determining whether or not it should be prescribed for a specific patient. One weakness found with some traditional slings is that they lack distal support. It is often necessary to support the distal upper extremity during ambulation and also during pre-gait activities, such as standing weight shifts and standing transfers.

The distal support sling described here is made by adding distal support components to the Bobath roll (1), the modified roll sling (2), or the shoulder saddle sling (3, 4). These slings have been used with good results for providing proximal support and positioning.

The distal support sling, as opposed to the traditional hemisling (4) or no sling at all, provides improved upper body symmetry, encourages reciprocal arm swing during ambulation, and provides additional proprioceptive input for increased awareness of the affected upper extremity. While protecting the flaccid extremity from trauma, it still provides dynamic support rather than the static support that is provided by the traditional hemisling. Because of the weight of the patient's arm, the Bobath roll sling may not properly realign the humeral head. In trying to raise the humeral head, further tightening of the roll under the arm is sometimes attempted; however, this results in compromised circulation. The distal support component could help to realign the joint and prevent a constant stretch on joint structures without compromising circulation.

Materials and Fabrication

Suggested materials for the fabrication of the distal support are as follows: 2.5-cm (1-in.)-wide cotton webbing; 5.0-cm (2-in.)-wide Vel foam, or a cardboard or plastic cone, or 3.5-cm (1.5-in.)-diameter cylindrical foam (three options for the handpiece); 2.3-cm (¾-in.)-diameter latex drainage tubing or 2.5-cm (1-in.)-wide elastic (optional).

The hand support (see Figures 1 and 2) is fabricated first. Initially, all parts are pinned together to allow for adjustments. A piece of webbing approximately 32.5 cm (13 in.) long is threaded through the cone and attached at wrist level in a V shape (see Figures 1 and 2, Point A). Webbing that straps approximately the length from the acromion process to the waist is attached to the hand support at Point A.

The patient must stand to determine the exact length of the vertical strap that extends from the hand support and is attached to the shoulder support (see Figure 3, Point B). The patient's hand should rest at about the level of the iliac crest. The amount of elbow flexion or extension can be varied by

![Image 1](http://ajot.aota.org/)

Dynamic component (elastic) and cone

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shortening or lengthening this vertical strap. Reassessment is recommended to determine the arm position during gait to make adjustments for changes in muscle tone before sewing.

Variations
The distal support can be modified to meet individual needs. Examples of successful variations include using a double-layered Vel-foam hand strap (see Figure 2) instead of a cone when distal edema or wrist pain occurs during extension. Firm cylindrical foam can be substituted when cones are unavailable or cannot be tolerated (3).

Forearm position can be altered to increase or decrease pronation/supination by adjusting the strap supporting the cone. When positioned radially, Point A of this strap promotes supination; when positioned ulnarily, it encourages pronation.

A dynamic wrist component is appropriate for individuals who need wrist extension via quick stretch (2). A 2.3-cm (¾-in.) length of latex drainage tubing or 2.5-cm (1-in.) elastic can be attached between Point A of the hand support and Point C of the vertical strap (see Figure 1).

When a shoulder saddle support is used, two straps are required to provide an equal anterior and posterior pull. The posterior strap is attached to the anterior strap with Velcro above the hand support (see Figure 4, Point D).

Discussion
The distal support sling is worn during gait activities, not while sitting or in bed. If the patient uses the shoulder support portion of the sling while sitting, his or her hand should be removed from the distal support or elevated. This prevents hand and wrist edema and is especially necessary for individuals prone to this condition.

The distal support sling is intended for use by the hemiplegic patient whose distal upper extremity muscle tone ranges from being flaccid to having manageable (minimal/moderate) spasticity. It is not appropriate for the individual who has severe spasticity, which results in a pronounced flexor synergy pattern. Thus, when choosing the base shoulder support, proximal muscle tone is always considered.

The distal support sling must be continually monitored during ambulation, transfers, and functional activities. Consideration must be given to changes in muscle tone, edema, circulation, and general upper body symmetry. (Currently, there are no data regarding the impact of this sling on these variables.) To ensure that optimum positioning is maintained over time, reevaluations and readjustments are very important.

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References

Related Readings
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