Modified Bobath Sling With Distal Support

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Clinicians have displayed an ongoing interest in shoulder supports that allow a hemiplegic extremity to remain in an extended position since Bobath first described one in 1978. Bobath attached a large foam roll to a figure 8 of cotton webbing to prevent downward traction on the gleno-humeral capsule while promoting normal muscle tone through active arm motion.

Other conventional upper extremity hemiplegic slings, such as the figure 8 and the Universal Hemiplegic Sling, are designed to restrict active motion of the arm by stabilizing the humerus into adduction and internal rotation and the elbow into flexion. Moodie, Brisbin, and Morgan (1986) noted that these slings interfere with body image, cause excessive immobilization, reinforce flexor synergy patterns, and do not provide motor and sensory stimulation. They, along with Smith and Okamoto (1981), preferred the positioning provided by a shoulder support, such as the Bobath shoulder roll, because this kind of support allows free arm movement, provides constant upper extremity sensory input, and allows bilateral use of the upper extremities.

In 1983 Walker identified several disadvantages of the Bobath shoulder roll. It laterally displaces the humerus into abduction and internal rotation. It is difficult to put on and take off independently because of a lack of front closure. Finally, it lacks distal support and therefore could lead to increased edema or harm secondary to neglect by the patient. Moodie et al. (1986) also found that the Bobath roll did not effectively reduce humeral subluxation.

Several clinicians have attempted to improve the roll’s design. Williams (1980) added a front closure under the affected extremity. Walker (1983) added a chest strap to facilitate scapular protraction and increase independence in putting on and taking off the sling. Rajaram and Holtz (1985) provided a forearm support to reduce humeral subluxation. Claus and Godfrey (1985) provided a distal support to increase tone in the flaccid extremity and reduce edema.

Despite these improvements, the shoulder roll still lacked the components to maximize functional motor return. The distal support did not accommodate the role of the thumb in upper extremity muscle tone or provide support for the wrist. In addition, the attachment of the distal support to the shoulder saddle may have exerted a downward pull on the humerus, and negated the upward support of the sling.

This article describes a modified Bobath sling.

1 The sling is referred to as the Bobath sling because it is an adaptation of Bert’s Bobath’s original idea. The use of her name does not reflect her endorsement of the sling.
that has a distal support using a reflex inhibiting position (see Figure 1). The modification places the thumb into extension and abduction and holds the wrist in a neutral position. The distal support attaches to the chest piece rather than to the shoulder saddle to reduce the direct pull of the forearm on the glenohumeral joint. Finally, the sling has a piece of foam rubber smaller in diameter to reduce lateral displacement of the head of the humerus, which can occur if the foam is too thick.

The primary purpose of this modified Bobath shoulder roll is to prevent shoulder pain from traction on the shoulder girdle for patients with flaccid extremities during ambulation. Criteria for use are any of the following: a painful or flaccid arm, mild edema, or neglect of the affected extremity during ambulation. It is questionable if this sling can prevent or reduce gleno-humeral subluxation because of the difficulty in incorporating the correct position of the scapula into the sling's design.

**Fabrication**

The modified Bobath sling is made as follows:

1. Measure a sufficient amount of 1 in. cotton webbing to circle under the affected arm and around the top of the shoulder joint.
2. Cut a piece of foam rubber (Rubizote) that is 1 in. wide and approximately 4 to 5 in. long.
3. Pull the cotton webbing through the foam support.
4. Sew the webbing together on a diagonal so that the top of the webbing rests on the top of the acromion process.
5. Place a D-ring on the chest portion of the webbing strap, approximately 2 in. above the foam support.
6. Attach a second piece of cotton webbing (either 1 in. or 2 in. in diameter) on the posterior portion of the webbing so that the webbing covers the inferior angle of the scapula.
7. Pull the strap around the rib cage, under the unaffected arm, and through the D-ring, letting it overlap on itself for approximately 6 in. Cut the webbing strap.
8. Sew a piece of touch fastener material (hook side up) on the bottom of the chest strap and another piece (loop side up) on the top of the strap.

The following steps explain how to make the distal support (see Figure 2):

1. Attach a D-ring to the chest strap midway between the sternum and the affected axilla.
2. Use 1 in. cotton webbing to form a loop around the metacarpophalangeal joint of the thumb, and sew the loop at a right angle so that the support is in one continuous piece.
3. Pull the strap over the dorsum of the wrist, make a loop around the wrist, and then pull the strap...
under the dorsal strap. Sew on touch fastener material to secure the loop on the dorsal aspect of the wrist.

4. Pull the webbing up to and then through the D-ring so that the end overlaps on itself approximately 8 in. Cut the strap.

5. Secure the overlapped webbing by sewing on a piece of touch fastener material.

Discussion

Although this modification of the Bobath sling has the advantages already discussed (e.g., facilitating normal tone and support of the wrist), it also has disadvantages. The distal support may be ineffective in reducing persistent edema because of the position of the forearm in extension below the level of the heart. Patients with significant perceptual deficits may need assistance in putting the sling on and taking it off. If the elbow is not kept in at least 150° of extension, the sling's original purpose may be compromised. In addition, the distal support may not provide enough support for very painful shoulders and may cause pain or subluxation in the thumb metacarpophalangeal joint if not constructed properly.

Since the fall of 1986, approximately 30 of these modified Bobath slings have been successfully used by patients at the Rehabilitation Institute of Chicago. The design of the sling has been modified several times to suit patients' needs: Some therapists now use (a) 2 in. rather than 1 in. webbing around the wrist for patients with larger hands and (b) a two-piece distal support made of a wrist cuff and thumb loop for patients who experienced pain in the thumb metacarpophalangeal joint when using the continuous thumb and wrist loop. Additional modifications in the distal support are encouraged to meet specific patients' needs.

This modified Bobath shoulder roll is designed to be one component of a treatment program to restore upper extremity function in hemiplegic patients and is not meant to replace other types of treatment. When a sling is needed, the one described here can be a positive alternative to traditional hemiplegic arm supports.

References


