Modified Strapping of Roll Sling

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Figure 1  (A) Front view, (B) back view
Hemiplegia often results in subluxation of the involved gleno-humeral joint, causing pain and decreased shoulder range of motion. Several methods of supporting the involved extremity are in use; however, many slings are unsatisfactory because of poor positioning or limitation of active range of motion. The traditional sling for the hemiplegic arm holds the shoulder internally rotated and adducted, elbow flexed, and forearm pronated. This positioning is believed to reinforce abnormal posturing, contribute to unilateral disregard, and inhibit active movement. The cuff-type sling, which is a support around the upper arm, frequently causes distal edema or friction irritation. The clavicle strap and traditional figure 8 roll sling have been found by many therapists to encourage abnormal shoulder retraction due to forces caused in strapping.

The method of strapping a roll sling discussed in this paper provides gleno-humeral support and minimizes abnormal positioning. This modification encourages scapular protraction and elevation of the gleno-humeral joint. The involved extremity is freed for active range of motion, or, if hypotonic, can be placed in an elastic cuff for neutral wrist support.

Materials and Fabrication
The sling is fabricated from the following materials: 2.5-cm (1-inch) wide webbing (length will vary); Velcro hook and loop (length will vary); two 3.0-cm (1/4-inch) D-rings; 15 x 17.5-cm (6 x 7-inch) medium density foam (egg crate type works well); 5-cm (2-inch) wide stockinette (approximately 15 inches); 7.5-cm (3-inch) wide elastic (approximately 10 inches), optional.

To construct sling, cut webbing approximately 25-cm (10-inches) larger than chest circumference at axillary level. Sew D-ring to one end of strap. Place webbing lengthwise on foam pad with D-ring end extending 7.5 cm (3-inches) past foam edge. Roll foam tightly, forming 7.5-cm (3-inch) circumference, and fasten with rubber bands or tape. Cover roll with doubled stockinette, pushing ends of stockinette between webbing and foam roll. Place roll under patient's affected shoulder with D-ring section anterior. Bring strap around to front, thread through D-ring, and fasten with Velcro (about 4-inch overlap). This is strap A. Strap B is sewn on webbing protruding from roll anteriorly, and near midline posteriorly. Strap C is sewn on webbing protruding from roll posteriorly and is brought to anterior midline and fastened with a D-ring and Velcro to strap A. All straps should be snug but not constricting. If necessary, sew wide elastic into a loop and place on strap A to be used for distal support. The patient dons sling by placing affected arm in loop formed by straps A and B, fastening strap A and then strap C (see Figure 1).

Discussion
The sling is machine washable and cosmetically appealing with its neutral color and small size. Many patients choose to wear the sling over an undershirt and under their outer clothing. This sling does not cause pressure over the cervical vertebrae, which is a common source of irritation from other slings, and patients can perform self range of motion when wearing it.

Many patients are able to don this sling independently; however, those with impaired dressing skills have difficulty with fastening the sling straps. A disadvantage to any roll-type sling is that it may displace the humeral head laterally. The Modified Roll Sling is not ideal for patients with heavy, flaccid arms. Care should be taken to monitor the extremity for distal edema if the elastic support strap is not used. Any sling should be applied only after careful consideration by a therapist.

The Modified Roll Sling has been found to minimize shoulder retraction while allowing for more normalized positioning of the involved extremity and permitting active and passive range of motion. In addition, it provides dynamic support for the hemiplegic hand if necessary. This method of strapping the roll sling has been used with 40 hemiparetic patients who have sustained cerebrovascular accident (CVA). The sling is prescribed: when patients experience onset of pain or shoulder girdle spasticity, approximately 4 to 6 weeks post-CVA.

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REFERENCE

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