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SLING USE WITH THE FLACCID UPPER EXTREMITY

Central Nervous System Brain Injury

Cameron Guster, OTS & Brittany Domin, OTS

Clinical Scenario

In the acute care setting, an occupational therapist often evaluates and treats patients after a central nervous system (CNS) brain injury. There are many intervention strategies used to help treat these conditions. Slings are most commonly used short-term with patients who present with a flaccid upper extremity. The main concern is the efficacy for the sling use with patients who fall under this diagnosis.



1 Ask: Research Question

What is the Efficacy of Using a Sling with a Flaccid Upper Extremity Post-Stroke or Traumatic Brain Injury?

2a Acquire: Search Terms

Patient/Client Group: acute care, post-stroke, CVA, TBI, CNS, adults

Intervention: sling, early intervention, occupational therapy, acute care

Comparison: no early intervention, different types of sling intervention

Outcome: reduce subluxation, reduce pain, improved quality of life

2b Acquire: Selected Articles

Ada, Foongchmcheay, & Canning (2009): A Cochrane review assessing the effectiveness of supportive devices in preventing subluxation, repositioning the humeral head in the glenoid fossa, decreasing pain, increasing function, and prevention of contractures post-CNS brain injury.

Aoyagi & Tsubahara (2004): A systematic review of multiple randomized control trials (RCTs) assessing the efficacy of supportive devices used in conjunction with other modalities on affected upper extremities of acute, subacute, chronic CNS brain injury patients.

Dieruf, Poole, Gregory, Rodriguez & Spizman (2005): A repeated measures design was conducted to test the effectiveness of the GivMohr sling on a flaccid affected limb in reducing vertical & horizontal subluxation, while providing support to the shoulder, measured through radiographs.

3a Appraise: Study Quality

Ada, Foongchmcheay & Canning (2009): Level I: Systematic Review. Suggestive: medium sample size (n=142), 1 sling and 3 strapping trials, participants met inclusion criteria. The articles had acceptable n-sizes involving supportive devices used to treat subluxation. The four devices: lap tray, arm trough, triangular sling, and Harris sling, were found evident to reduce a subluxation, but research is needed for subluxation prevention.

Aoyagi & Tsubahara (2004): Level I: Systematic Review. Suggestive: study contains orthotic, prosthetic, electrical, and robotic interventions as the primary evidence reviewed in the RCTs. Evidence supports initial short-term sling use, but does not support long-term use post-CNS brain injury.

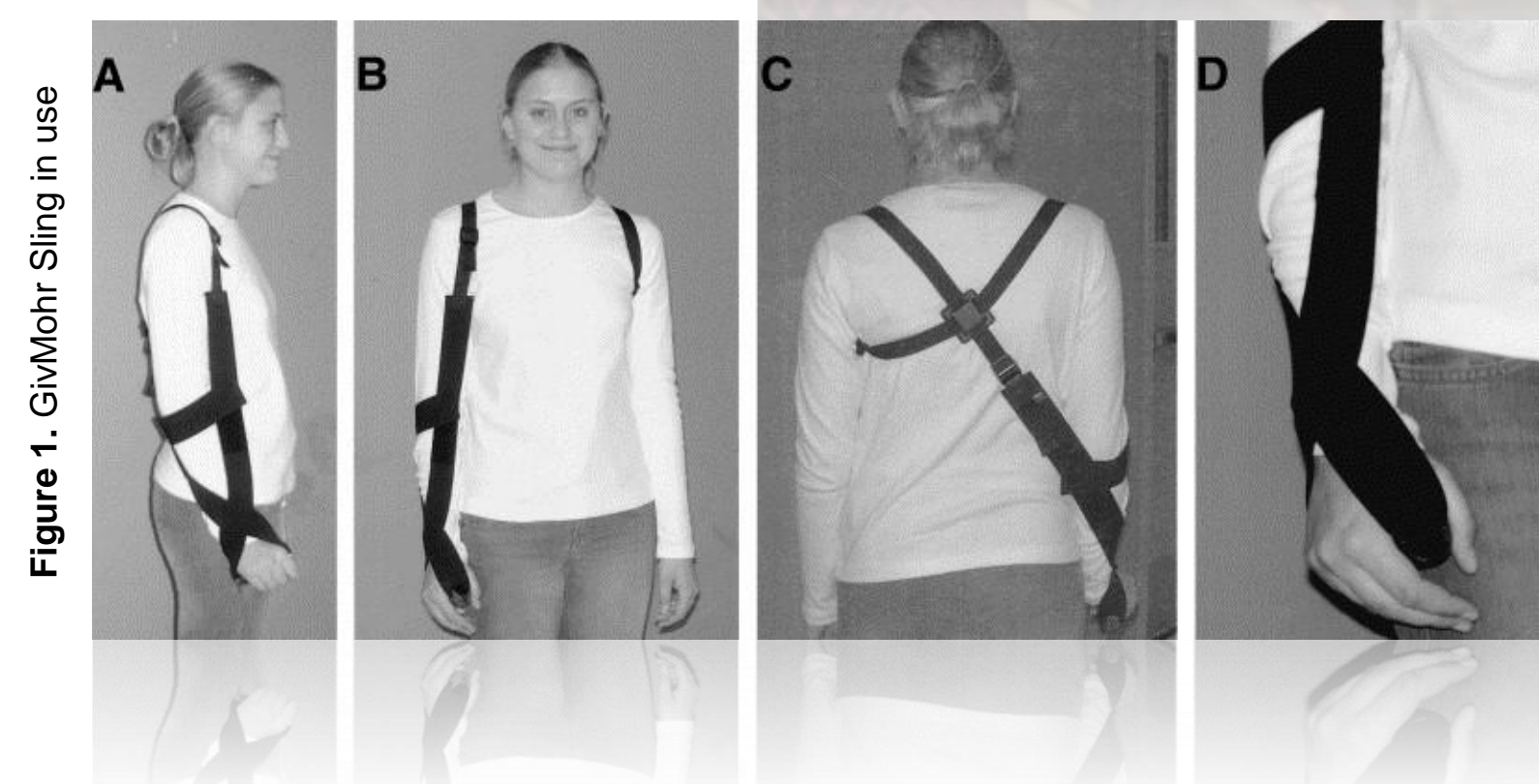
Dieruf, Poole, Gregory, Rodriguez & Spizman (2005): Level III: Nonrandomized control trial. Preponderant: low sample size (n=25), age range of 37-79. Conducted among patients with UE flaccidity at two major rehabilitation hospitals. Limited results due to concern for radiographic exposure.

3b Appraise: Study Results The findings of these studies support short-term sling use for a flaccid upper extremity. Research suggests that post-CNS brain injury intervention involves the use of a sling to help prevent pain and vertical subluxation, although these conditions are not correlated to each other. Results from an ANOVA post hoc test revealed that the GivMohr Sling was significant ($p < .001$) in vertical subluxation reduction when compared to the Roylan humeral cuff and the unsupported involved shoulder. There was no evidence found to conclude whether supportive devices can reposition the head of the humerus in the glenoid fossa of an already subluxed shoulder. Strapping is another intervention that is effective in delaying shoulder pain short-term (within 14 days), but does not prevent shoulder pain long-term. Although there is a lack of research to demonstrate long-term sling use, studies recommend utilizing a sling during ambulation as a purpose for protection of the flaccid upper extremity.

4 Apply: Conclusions for Practice Although current research is not available regarding the efficacy of long-term sling use in practice, there is promising research in support of the GivMohr Sling short-term. This sling was shown to reduce vertical subluxation in post-CNS brain injury patients without overcorrecting position of the shoulder. Our findings indicate the use of electrical stimulation significantly improves subluxation, pain, arm function, and range of motion up to six weeks post treatment. This is an area that needs further research in conjunction with sling use. Conclusion of research supports the use of a short-term sling, while long-term sling use still is in need of further research for practical implication.

References:

- Ada, L., Foongchmcheay, A., & Canning, C.G. (2009). Supportive devices for preventing and treating subluxation of the shoulder after stroke. *Cochrane Database of Systematic Reviews*, 2005(1). doi: 10.1002/14651858.CD003863.pub2.
- Aoyagi, Y. & Tsubahara, A. (2004). Therapeutic Orthosis and Electrical Stimulation for upper extremity hemiplegia after stroke: A review of effectiveness based on evidence. *Topics in Stroke Rehabilitation*, 11:3(9-15). doi: 10.1310/6Q5Q-69PU-NLQ9-AVMR.
- Dieruf, K., Poole, J.L., Gregory, C., Rodriguez, E.J., & Spizman, C. (2005). Comparative effectiveness of the givmohr sling in subjects with flaccid upper limbs on subluxation through radiologic analysis. *Archives of Physical Medicine and Rehabilitation*, 86. doi: 10.1016/j.apmr.2005.07.291.



The short-term use of a sling with a flaccid UE with a CNS brain injury is supported. Longitudinal RTCs need to be conducted for long-term sling use.

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