USING DYNAMIC LOW LOAD PROLONGED STRETCH PROTOCOLS TO OBTAIN AN INCREASE OF ROM IN THE HIP JOINT OF CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Contracture management of the hip using low load prolonged stretch can show improvements in range of motion (ROM) in children with cerebral palsy. The purpose of low load prolonged stretch (LLPS) contracture treatment is to obtain an increase of ROM, using methods that are more affective and increase patient compliance while decreasing discomfort. The increased range of joint motion allows the achievement of fixed goals. Two secondary data, case studies were recorded, for both patients, an orthosis was fabricated, and a treatment plan was developed using LLPS-principles. Results showed improvements in both ROM at the hip and an increase in scores associated with the activities of daily living scale (ADLs).

INTRODUCTION

Dynamic management of the hip using low load prolonged stretch can show improvements in ROM. The purpose of LLPS treatment is to obtain an increase of ROM of the hip joint that has decreased capabilities as a result of spasticity and hypertonia. The increased range of joint motion allows the achievement of fixed goals such as better gait pattern, specific daily activities, hygienic matters or personal objectives with minor inconveniences and minimal pain. The proposed multidisciplinary treatment plan includes, managing the hip joint ROM through night time dynamic contracture management, daytime dynamic orthosis wear in addition to physical therapy intervention. Established clinical measurement tools can be used to measure outcomes.

MATERIALS AND METHODS

Case study subjects included 2 pediatric patients. The first subject was a 10-year-old boy with diplegic cerebral palsy, measured at a GMFCS III after a Varus derotation osteotomy 1.5 years earlier. He used a Kaye walker and a wheel chair for longer distances, using a static hip abduction orthosis at night. The second subject was a 9-year-old girl diagnosed with diplegic cerebral palsy, measured at a GMFCS III, she also used a Kaye walker and static hip abduction orthosis at night time.

Two secondary data, case studies were recorded, for both patients, an orthosis was fabricated, and a treatment plan was developed using LLPS-principles. Each orthosis was custom made, designed following the individual needs of the patient per existing ROM/contracture management protocols. The devices were fitted at first without force to check comfort and to achieve the correct wearing time.

Active range of motion (AROM) and passive range of motion (PROM) in the contracted joint was measured with a standard goniometer in the beginning of the treatment and weekly after delivery of the orthoses to check the progress. In a treatment time of two months (wearing time 6 to 8 hours at night time, with a minimum of 5 days a week, force following evolution up to approximately 3.5 Nm) gains of end range of passive abduction were measured to evaluate for any improvement. This method was used complementary to the manual therapy (High Load Brief Stretch) that was already part of the treatment plan, which the patients already had before starting the LLPS treatment. Improvement in ROM was then documented. (Figure 1,2)

CONCLUSIONS

Using the dynamic hip abduction system as part of a night time protocol maintains ROM to helps with the ability to perform ADLs. These night time protocols need to be used in combination with therapeutic exercises to achieve these types of results. Other considerations may also include variations in the concept of the orthosis; such as fabrication with or without adjustable knee joint? There still needs to be more data gathered to include subjects throughout the spectrums of GMFCS level in order to have more significant results Traditional approaches should continue to be challenged to assure the most effective/best practices are being used for the highest quality of care for individuals with cerebral palsy.

RESULTS

Increases were observed in PROM (Figure 1,2) for both subjects as well as increases in the activities of daily living scores (Chart 1,2) after using night time low load prolonged stretch night time contracture management treatment protocols

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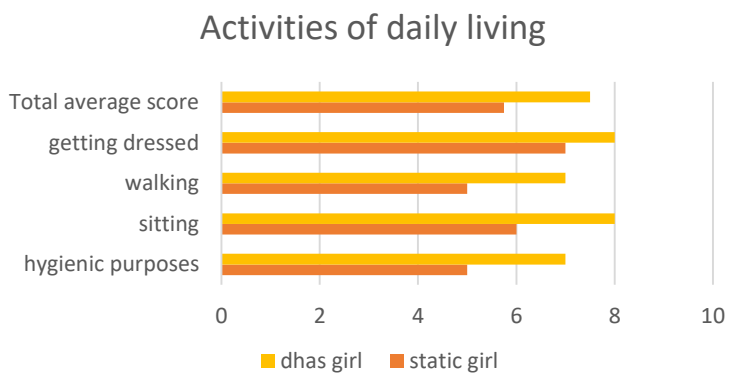


Chart 1. Girl comparison between ADLs using static night stretch vs dynamic night time stretch

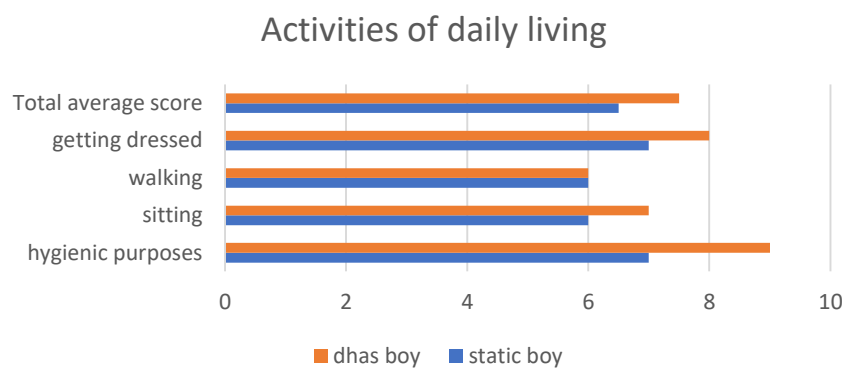
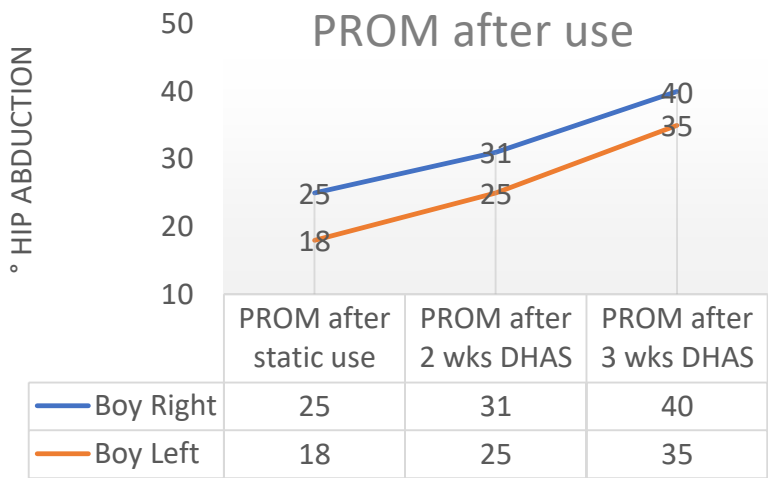


Chart 2. Boy comparison between ADLs using static night stretch vs dynamic night time stretch

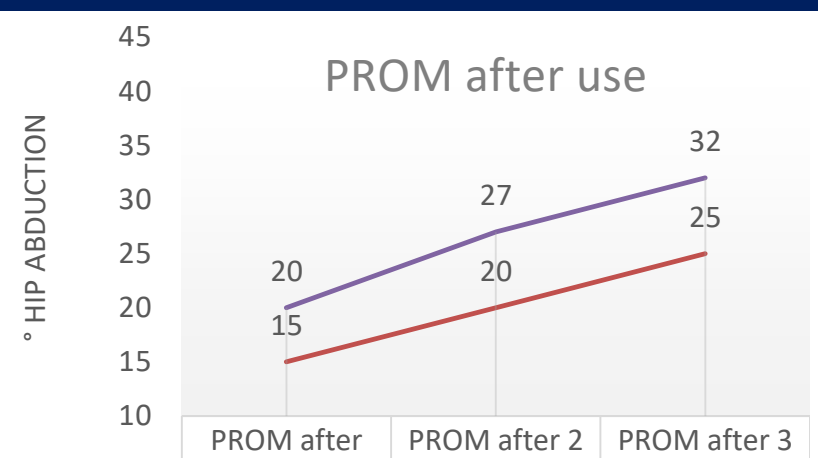
DATA BOY



	PROM after static use	PROM after 2 wks DHAS	PROM after 3 wks DHAS
Boy Right	25	31	40
Boy Left	18	25	35

Figure 1. Boy results passive range of motion (PROM) after using dynamic LLPS at night time.

DATA GIRL



	PROM after static use	PROM after 2 wks DHAS	PROM after 3 wks DHAS
girl right	15	20	25
girl left	20	27	32

Figure 2. Girl results passive range of motion (PROM) after using dynamic LLPS at night time.

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