Device for Stretching Spastic Hip Adductor Muscles

Suggestion from the Field

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The application of low loads over prolonged periods of time as a means of lengthening shortened soft tissues and reducing hypertonus is well supported in the literature. Techniques are not always available, however, for the practical application of such loads in a clinical setting, particularly for patients with decreased range of motion associated with spastic musculature. A specific movement that is frequently reduced in patients with increased tone in the muscles of their lower extremities is hip abduction. Odéen reported increased voluntary and passive hip abduction after both single and repeated 30-minute periods of hip adductor muscle stretch. They had patients with spastic paraparesis use a device that helped them to gradually increase their hip abduction by turning a wheel which in turn separated their legs.

PROBLEM

Though effective, the device described by Odéen is not currently available to most therapists or patients. An apparatus to increase hip abduction is needed that can be easily fabricated from available materials.

The need for such an apparatus was demonstrated in a patient referred to me. The patient had multiple sclerosis and accompanying spasticity of the lower extremities that was especially severe (greater than 3 on the Ashworth scale) in the hip adductor muscles. Also, the patient had a large scrotal lesion that further necessitated that his hips be abducted for proper wound care.

HIP ABDUCTION DEVICE

Scissors-type car jacks by virtue of their construction can be expanded against large forces with a minimal effort. This characteristic makes them ideal for applying loads over long periods of time to spastic hip adductor muscles. A specific model of jack was found that collapses to less than 8 cm at its greatest width and that has a rounded end that eases its insertion between the thighs. The jack weighs less than 3 kg and costs about $34.

The jack was modified before being used in treating the patient. The slotted projection on the top of the jack and the corners of the base were removed. This left two flat surfaces to which thigh cuffs could be attached. One cuff was attached directly to the base of the jack, and the other was attached to the upper surface with banding metal. The two cuffs were fabricated from Kay-Splint to conform to the patient's thighs. Velcro hook material was then glued to the cuffs with Velcro adhesive, and Velfoam® padding was attached to hold the cuffs securely to the thighs. Figure 1 illustrates the adapted jack in a collapsed state with the cuffs attached. In this state the device could be introduced between the patient's thighs in spite of his spasticity. Once fully inserted and secured,
Fig. 2. Device being used to abduct the hips of a seated subject.

the jack could be expanded slowly by turning the jack screw. Figure 2 demonstrates how the device held the hips of a seated individual in an abducted position.

DISCUSSION

The patient was quite satisfied with the device, which could be applied and adjusted by his family. The cuffs were wide enough to reduce the pressure of the hip abduction load, and the mechanical advantage afforded by the jack screw allowed proper hip abduction to be achieved with less effort and to be maintained longer than was possible by manual methods alone. Though constructed to be used while the patient was sitting, the device could be altered for use with supine patients. The device could also be lightened by drilling out a large portion of the body of the jack. Despite its medieval appearance and its relatively high cost, this device does provide an effective means of handling a common clinical problem and merits broader application and refinement.

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REFERENCES