It should also be noted that in our practice, patients up to the age of approximately six years old are provided with solid ankles and knees since their legs are still short enough to sit through hip flexion without obstructing much of the space in front of the chair. The purpose of this is to provide the patient with maximum stability and lightweight orthoses. As the patient gains upper limb strength and mobility, knee joints with drop locks are added, usually of the lateral single bar type. Double bars are only used when the patient is relatively heavy and when there is a torsional problem in the orthosis. The ankle-foot portion of the orthosis remains of the solid ankle type to provide the largest possible base of support over which the patient's center of gravity can be maintained with a greater degree of latitude than is possible if orthotic ankle joints were to be used.

ACKNOWLEDGMENT

The assistance of Barry Gosthnian, CPO in developing the system described is gratefully acknowledged.

Technical Note

Rigid A.F.O.—Another Choice

by Robert E. Doran, C.P.O.*

When an orthotic prescription calls for an ankle/foot orthosis to provide rigid ankle/foot stabilization, the two basic choices have been (1) a double bar metal orthosis or (2) a thick and/or reinforced thermoplastic orthosis. We are all familiar with the advantages and disadvantages each has to offer.

It was this author's goal to design a rigid A.F.O. that would combine the advantages of both. The features of such an orthosis should include light-weight construction; provide rigid ankle stabilization; provide adjustable plantar and dorsiflexion in order to dynamically align the orthosis; fit inside the shoe; be cosmetically acceptable; be easily donned; and maintain alignment while changing heel heights.

With the above in mind, the following orthosis was designed. The orthosis consists of "prepreg" (the resin is impregnated in the matrix in an uncatalyzed form prior to lay-up, generally at the factory. Once the desired lay-up is achieved, the structure is exposed to a catalyzing agent so that it hardens), carbon-fiber and fiberglass fabric. Epoxy and polyester resin have been used as bonding agents and the orthosis is formed over a plaster model of the patient's leg. Such pressure applying agents as vacuum bags and pressure wraps have been used. The carbon fiber and fiberglass fabric are properly oriented to resist the stresses imposed upon the orthosis and comprise a structure that provides a high strength to weight ratio.

The orthosis has a foot section which begins on the plantar aspect of the foot and extends proximally on the medial and lateral sides of the leg. The "uprights" are connected by adjustable velcro-closing calf straps. Plantar and dorsiflexion adjustments are independently achieved by adjusting the anterior and posterior velcro-closing calf straps (see Figures 1-3).

In some cases, donning is simplified by removing the posterior strap, thus allowing for a posterior entry of the foot and leg into the orthosis and shoe.

Over the past eighteen months, nine patients with diagnoses that include low level paraplegic, C.V.A., and neuromuscular disease have been fitted with the graphite composite A.F.O. as a successful alternative to "traditional" orthoses.

Orthotists now have another choice when designing a rigid ankle foot orthosis for their patients. The graphite composite A.F.O. combines some of the advantages of the standard metal and thermoplastic constructed A.F.O.

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