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Title	Design and Static loading test of AFOs to control foot drop among patients with Peroneal Nerve injury
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Abstract

Ankle foot orthotics can help persons with disabilities such as drop foot to ambulate more optimally. However, before clinical use, the design and static mechanical testing of such devices must occur. The purpose of this study was to design and fabricate an adjustable Posterior Leaf Spring (PLS) ankle-foot orthosis (AFO) and to perform the mechanical static loading test for an Adjustable PLS AFO and traditional flexible AFO. Static mechanical testing (bending test) was performed using an Instron 8801 machine for two different AFO designs; the adjustable PLS AFO and traditional flexible AFO. Both AFOs were made with 5mm Polypropylene (PP). The posterior bar of PLS AFO was made with 8mm thick polypropylene (PP), and in traditional AFO, 3mm PP was added and reinforced before thermoforming with 5mm PP. The stiffness properties were calculated from the slope of the moment versus angles graph and were as follows: adjustable PLS AFO was 0.4Nm/ degree to 0.6Nm/degree, while Traditional flexible AFO has 0.3Nm/degree to 0.5Nm/degree. In the same way, adjustable PLS AFO requires the maximum Load (25 to 31 N) for the final displacement when traditional AFO needs 26 N only. The adjustable PLS AFO has higher stiffness properties than the traditional flexible AFO. Future studies are planned to evaluate the lower limb spatiotemporal and sagittal kinematic gait parameters of foot drop patients during walking.