ELECTRONIC PROSTHESIS FOR THE PARTIAL HAND AMPUTEE

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There exists a proportionally large upper extremity patient population that presents an absence at the carpal level. Until recently, prosthetic intervention was limited to a passive restoration, a rigid opposition post, or a body-powered hook style terminal device with control harness. The carpal level amputation challenges the prosthetist because the use of most existing functional terminal devices results in a significant contralateral limb length discrepancy. A small group of carpal level amputees have been fit over the last several years with a highly modified Otto Bock electric hand that in effect decreases the overall length of the terminal device by rotating the transmission and motor assembly. These modified electric hands compromised cosmesis for function as the rotated transmission resulted in loss of the hand’s natural appearance. The modification also voided the manufacturer’s warranty and led to an increased component maintenance and failure. Even with these limitations, many of the patients fit with modified electric hands continued to utilize them because of the increase in grip force and the independence from using gross body movement to control the terminal device.

Responding to the challenges of the carpal level amputee population, Otto Bock has introduced an electric hand with a shortened chassis and overall length. This paper will examine the functional benefits of a production version carpal level electric hand, control scheme options, and interface design considerations.

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