Analysis of voluntary opening Ottobock Hook and Hosmer Hook for upper limb prosthetics: a preliminary study.

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Abstract
There are a number of prosthetic terminal devices which offer functional restoration to individuals with upper limb deficiencies. Hosmer and Ottobock are major commercial hook providers for prosthetic-terminal devices. The concern of this paper is to analyse the voluntary opening (VO) Ottobock model 10A18 and Hosmer model 95P hooks (one hand) during opening operation and to find out favourable features in the design. Two tests were conducted to analyse the performance of both hooks. The first test used a simple bench test to investigate cable excursion and hook opening angle and the second test used force sensor to find out the force supplied at a different hook opening angle. The study found that the average cable excursion for both hooks is approximately 30% less than the hook's opening span with the force at the hook's tip section being inversely proportional to the force at the lateral section. Ottobock 10A18 has a better control for grasping larger objects, while Hosmer 95P has the highest average force at the tip section but yet less efficient in generating adequate force for activities of daily living. Favourable features identified are low cable excursion per hook opening span and balance lateral to hook tip pinch force.