

REVIEW OF THE CURRENT LITERATURE ON THE CLINICAL BENEFITS OF MULTIARTICULATING PROSTHETIC HANDS.

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INTRODUCTION

For more than 40 years, myoelectric prosthetic hands have only allowed for the tripod opposition grip. In the past 10 years, multiarticulating hands offering up to 36 different grips have become available and popular among patients and clinicians (1). Therefore, a review of the literature on the clinical benefits of multiarticulating hands appears warranted.

METHOD

Scientific literature was searched in the Medline, Embase, CINAHL, OTseeker, and PEDro as well as in the online library of the Journal of Prosthetics & Orthotics. Search terms were related to multiarticulating prosthetic hands and their clinical benefits. Identified references were evaluated for pertinence to the subject and then analyzed.

RESULTS

Only three publications, one case study (2) and two clinical studies (3, 4) on the clinical benefits of multiarticulating hands could be identified. The case study (2) was conducted with the iLimb in a 45-year old man with a wrist disarticulation and concluded that it had only limited additional functionality compared to the DMC plus hand (2). The two clinical studies were both conducted with the Michelangelo hand. A survey with the OPUS-UEFS for perceived function in 16 transradial amputees demonstrated improved ease of performing activities of daily living (ADL) and increased active use of the multiarticulating as compared to standard myoelectric hands (3). A study with 6 transradial amputees assessing performance-based outcomes measures found significant improvements in the SHAP, the Box and Blocks test, and the Minnesota Manual Dexterity Test (4). Patient interviews after 6 months revealed enhanced perceived functionality and the perception of Michelangelo “as a real hand”, resulting in improved integration of the prosthesis into the body image (4).

DISCUSSION

The body of published evidence for the clinical benefits of multiarticulating prosthetic hands is still very limited. Two studies have found significant improvements with the Michelangelo hand. No studies have been found with multiarticulating hands that offer even more grip patterns. Therefore, it remains unclear if the clinical benefits of all multiarticulating hands are comparable or if there is a correlation between the number of available grip patterns of a hand and the magnitude of clinical benefits it may deliver.

REFERENCES

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DISCLOSURE

Andreas Kannenberg is a full-time employee of Otto Bock.