„Can the adverse complications of foot drop be prevented by endoprosthesis: design and development of a prototype device“. Author: **MUDr. Bassel EL-OSTA**

Review:

The research paper titled "Can the adverse complications of foot drop be prevented by endoprosthesis: design and development of a prototype device" offers a thorough and insightful examination of the potential applications of endoprosthesis in addressing the challenges associated with foot drop. The authors have undertaken a commendable effort to bridge the realms of medical science and engineering, presenting a compelling case for the development of a prototype device.

The strength of this research lies in its meticulous approach to understanding the complexities of foot drop, encompassing biomechanics, patient-specific considerations, and the integration of cutting-edge technology. The author delves into the biomechanical intricacies involved in foot and ankle movement, emphasizing the importance of mimicking natural functionality. The consideration of materials, with a focus on biocompatibility and durability, showcases a commitment to the longevity and safety of the proposed endoprosthesis device.
One notable strength is the acknowledgment of the need for patient-specific design. The research highlights the potential role of sensors and control systems in enhancing the adaptability of the device to individual patient needs. Recognizing that foot drop severity and patient characteristics can vary significantly, the author propose a customized approach, potentially improving the overall efficacy of the device.

However, the paper would benefit from a more detailed discussion on the specific challenges faced during the design and development phases, as well as a comprehensive overview of the clinical testing protocols and results. Additionally, a deeper exploration of potential limitations and ethical considerations would enhance the research’s completeness.

In conclusion, "Can the adverse complications of foot drop be prevented by endoprosthesis: design and development of a prototype device" presents a promising exploration into an innovative solution for foot drop complications. Its interdisciplinary approach and emphasis on customization make it a valuable contribution to the evolving field of medical engineering.

Overall, I rate the work presented very positively. It meets without fail the criteria set for a study of this importance, it certainly addresses a serious issue with clear conclusions for practice and lays a solid foundation for further research and development in the pursuit of improving the quality of life for individuals affected by foot drop.

I recommend to the esteemed committee the submitted thesis to be defended and, upon its successful completion, to be awarded the degree of Ph.D.

November 27, 2023 doc. MUDr. Pavel Douša, CSc.