

CASE REPORT

Functional Impact on Quality of Life of an Aesthetic Prosthetic Device for the Dominant Upper Limb: A Case Report

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Abstract

Objective: Upper limb amputation represents a major challenge, both functionally and psychologically, as well as socially. This article presents the case of an adult patient fitted with an aesthetic prosthesis for his amputated upper limb. Through this case study, we analyze the functional impact of this type of prosthesis on the patient's quality of life, even though such devices are primarily designed for aesthetic and psychological benefits.

Case report: Mr. A. Lhcen, a 44-year-old right-hand dominant male, suffered a work-related amputation of his right hand. He was fitted with a lightweight, non-articulated silicone aesthetic prosthesis. To address his specific needs, occupational therapy adaptation strategies and prosthesis modifications were implemented. This enabled him to use the prosthesis for certain Activities of Daily Living (ADLs), including professional tasks, dressing, eating, hygiene, and showering, maintaining autonomy in most activities.

Conclusion: This case highlights that an aesthetic prosthesis for a dominant hand amputation can be made functional through specific modifications and occupational therapy strategies. Appropriate ergonomic support and patient adaptability are crucial for maintaining a high level of independence and improving the quality of life for amputee patients.

Keywords: Aesthetic Prostheses, Rehabilitation, Quality of Life.

1. Case Presentation

Mr. A. Lhcen is a 44-year-old married man and father of four. He worked in a carpentry workshop where he was a victim of a work accident in 2021, resulting in the amputation of his right hand (dominant hand). Neglect of his right side led to a loss of shoulder range of motion one year post-amputation, for which he underwent physiotherapy for functional rehabilitation.

Due to financial constraints, he could not acquire a hand prosthesis until 2024. The provided prosthesis was a non-articulated aesthetic type, consisting of a non-functional hand with silicone gloves. The prosthesis is lightweight, which does not hinder the performance of Activities of Daily Living (ADLs). Although non-articulated, the patient expressed a strong desire to use it daily. Consequently, Mr. Lhcen received occupational therapy intervention comprising

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10 sessions of learning, situational training, and re-training with proposed adaptations.

However, for spiritual reasons, Mr. Lhcen wished to eat with his right hand instead of his left. To facilitate this, modifications were made to the prosthesis to enhance its functionality, specifically the creation of a custom-made metacarpal bracelet to hold utensils.

Regarding dressing, he receives help from his wife and has replaced closed shoes with open sandals featuring Velcro straps for easy wearing. To facilitate buttoning shirts, it was recommended to install a Velcro strip behind the buttons, allowing for closure without compromising aesthetics.

Showering and personal hygiene were also challenging due to difficulty reaching certain areas of his body. To overcome this, Mr. Lhcen was advised to use a washcloth worn on the right hand and a long-handled

brush used with the left hand to access hard-to-reach areas.

Concerning productivity and work, he was able to resume his activity as a carpentry trainer in the same workshop. He developed his own adaptation strategies to operate certain machinery, albeit with remaining limitations in this domain.

Overall, Mr. A. Lhcen has maintained independence in the majority of his ADLs and has developed personal adaptation strategies. His transfer of laterality was successfully achieved, facilitating the execution of his daily tasks. He demonstrates exemplary motivation and a significant capacity for adaptation in using his prosthesis, despite its functional limitations. These qualities, combined with appropriate ergonomic follow-up, are expected to further optimize his autonomy and quality of life.

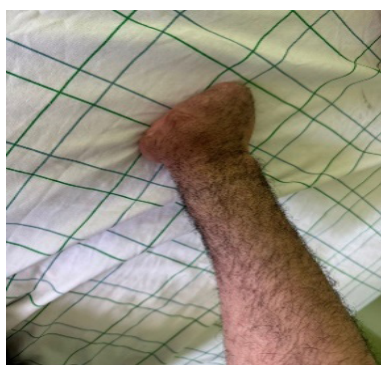


Figure 1. Image of the amputated right hand.



Figure 2. Image showing the prosthesis with a silicone glove.



Figure 3. Custom-made metacarpal bracelet holding a spoon.



Figure 4. Custom-made metacarpal bracelet holding a spoon.

2. Discussion/Conclusion

An aesthetic upper limb prosthesis is primarily designed to improve physical appearance but typically lacks mechanical or articular functionalities (1). However, its utility can be enhanced by integrating certain elements or adopting strategies to improve its functionality in daily life (2, 3).

Strategies to improve the functionality of an aesthetic prosthesis in occupational therapy include integrating passive elements to enhance grip using non-slip materials, adding simple mechanical features like

passive joints, and improving comfort with fitted liners (4). The prosthesis can also be customized for specific activities, be modular, or incorporate simple technologies like tactile sensors. Hybrid solutions combining aesthetics and functionality are possible, and training to optimize use is essential (5, 6).

Intensive rehabilitation and patient motivation are crucial for successful adaptation, while the choice of a suitable prosthesis and its cost are determining factors (7, 8). This case demonstrates that an aesthetic prosthetic device can improve functionality and

quality of life for patients with upper limb amputations. Despite the limitations of an aesthetic upper limb prosthesis, appropriate fitting, ergonomic support, and targeted rehabilitation can significantly improve patient autonomy and quality of life (2). This case reveals that with specific adaptations and personalized occupational therapy support, an aesthetic prosthesis can meet daily needs, including spiritual and cultural requirements (9). It highlights the necessity for hybrid solutions combining aesthetics and functionality to better satisfy the needs of amputee patients and the importance of further research on the overall impact of these prostheses.

3. References

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