

Reference

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A bionic hand vs. a replanted hand

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Products

bebionic Hand

Major Findings

In this case study with bebionic Hand compared to a replanted hand:
→ When hand function of a replanted hand does not reach satisfactory levels, a planned amputation and a prosthetic hand can be beneficial.

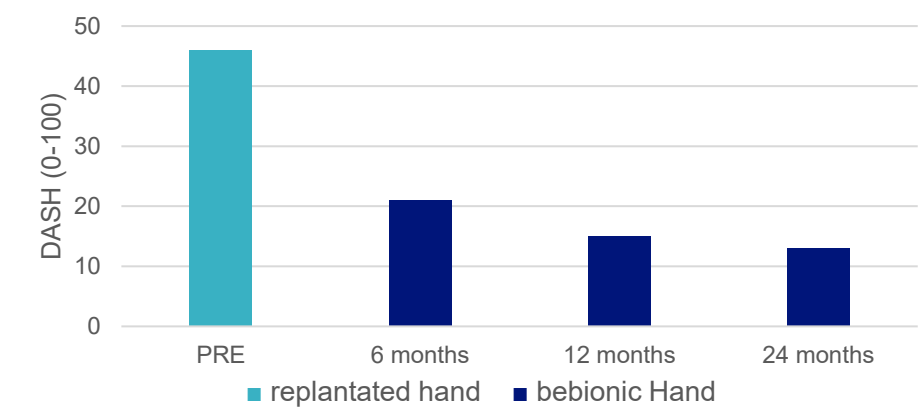


Figure 1. DASH (Disability of the Arm, Shoulder and Hand) over time, with replanted hand (PRE = pre-intervention) and bebionic Hand (6, 12, 24 months)

After amputation of the replanted hand and fitting with myoelectric prosthesis, a reduction of the disability was measured (54%, 67% and 71% reduction over time).

Population

Subjects:

Previous condition:

Amputation causes:

Mean age:

Mean time since amputation:

Amputation level:

1 male

replanted hand 23 years ago after work accident

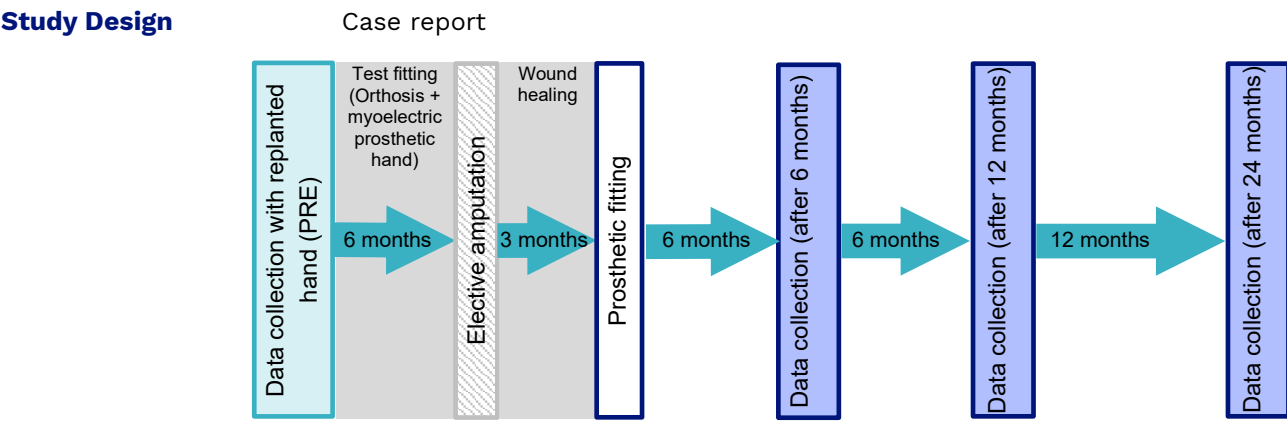
initially: substantial trauma

secondary: improve function and appearance

51

immediately after healing

transradial



During a first assessment, function of the replanted hand was measured (PRE = pre-intervention). After elective amputation, wound healing and fitting of an OB Sensor Hand Speed at 3 months post-surgery, fitting with the bebionic Hand at 5 months post-surgery, 3 measurements were conducted (6, 12 and 24 months post-surgery).

Results

Body Function		Activity			Participation	Others	
Mechanics	Pain	Grip patterns / force	Manual dexterity	Activities of daily living (ADL)	Satisfaction and Quality of life (QoL)	Training	Technical aspect

Category	Outcomes	Results for replanted hand vs. bebionic Hand				
		PRE (replanted hand)	6 months	12 months	24 months	Sig. ^a
Pain	Neuropathic Pain Symptom Inventory (NPSI)	0.27	0.23	0.19	0.08	n.a.
		Decreased pain after fitting with bebionic Hand compared to replanted hand				
	Brief Pain Inventory Short Form (BPI-SF)	3	1	0	3.5*	n.a.
		Decreased pain after fitting with bebionic Hand compared to replanted hand				
		*At 24 month follow up, the patient reported low back pain that affected the score in BPI.				
Activities of Daily Living (ADLs)	Pain in rest (VAS)	4	5	2	1	n.a.
		Decreased pain after fitting with bebionic Hand compared to replanted hand				
	Cold Intolerance Severity Score (CISS)	76	4	4	4	n.a.
		Relief of symptoms on cold exposure after fitting with bebionic Hand compared to replanted hand				
	Southampton Hand Assessment Procedure (SHAP)	22.49	38.1	30.74	/**	n.a.
		Improved grip function after fitting with bebionic Hand compared to replanted hand				
		**At 24 months, the patient refused to complete the SHAP-test				
	Disability of the Arm, Shoulder and Hand (DASH)	46	21	15	13	n.a.
		Decrease of measured disability score after fitting with bebionic Hand compared to replanted hand				
	Canadian Occupational Performance Measure (COPM; performance/satisfaction)	3.8/4	8.5/8.5	8.5/8.5	7/7.2	n.a.
		Improvement in performance and satisfaction of the selected activities after fitting with bebionic Hand compared to replanted hand				

Category	Outcomes	Results for replanted hand vs. bebionic Hand				
		PRE (replanted hand)	6 months	12 months	24 months	Sig. ^a
Satisfaction, Quality of Life (QoL)	SF-36					
	Physical functioning	70	80	75	80	n.a.
	Role limitations due to physical health	0	0	50	75	n.a.
	Role limitation due to emotional problems	100	0	100	100	n.a.
	Energy/fatigue	30	80	60	50	n.a.
	Emotional well-being	64	92	85	80	n.a.
	Social functioning	75	100	87.5	87.5	n.a.
	Pain	55	80	90	57.5*	n.a.
	General health	75	80	60	80	n.a.

General improvement in Quality of life after elective amputation and fitting with bebionic Hand

*At 24 month follow up, the patient reported low back pain that affected the score.

^a no difference (0), positive trend (+), negative trend (–), significant (++/--), not applicable (n.a.)

Author's Conclusion

“The planned amputation and subsequent fitting and usage of a hand prosthesis were satisfying for the individual with positive effects on activity and participation.” (Wijk et al., 2024)

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