

**PATIENT SATISFACTION AND FUNCTIONAL OUTCOMES OF SILICONE VS. ACRYLIC FINGER PROSTHESES IN POST-TRAUMATIC FINGER LOSS****Dr. Manju Choudhary***

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ABSTRACT**Background:** Finger loss due to trauma significantly impairs hand function and aesthetics, affecting quality of life. Prosthetic rehabilitation using silicone or acrylic materials is commonly employed to restore function and appearance.

Aim: To compare patient satisfaction and functional outcomes between silicone and acrylic finger prostheses in post-traumatic finger loss.

Materials and Methods: A prospective comparative study was conducted on 30 patients with unilateral partial finger amputation. Patients were divided into two groups: Group A (silicone prosthesis, n=15) and Group B (acrylic prosthesis, n=15). Functional outcomes were assessed using grip and pinch strength measurements and the Purdue Pegboard test. Patient satisfaction was evaluated using a validated questionnaire on aesthetics, comfort, and ease of use. Statistical analysis was performed using independent t-tests and Mann-Whitney U tests; significance was set at $p < 0.05$.

Results: Silicone prostheses demonstrated significantly higher patient satisfaction scores for aesthetics and comfort ($p < 0.01$). Functional outcomes including pinch strength and dexterity were slightly higher in the silicone group but not statistically significant ($p > 0.05$).

Conclusion: Silicone finger prostheses provide superior patient satisfaction compared to acrylic prostheses while maintaining comparable functional outcomes. Incorporating silicone prostheses in rehabilitation protocols may improve psychosocial and aesthetic outcomes for patients with finger loss.

KEYWORDS : finger prosthesis, silicone, acrylic, functional outcomes, patient satisfaction, post-traumatic rehabilitation**INTRODUCTION**

Post-traumatic finger amputations are among the most common hand injuries, leading to functional impairment, loss of dexterity, and significant psychosocial impact [1]. Finger prostheses are an essential component of rehabilitation, aiming to restore appearance and partial function [2].

Material selection is crucial in prosthesis fabrication. Silicone prostheses are highly elastic, provide lifelike appearance, and improve comfort, whereas acrylic prostheses are rigid, durable, and cost-effective [3,4]. Both materials have been used extensively; however, comparative studies evaluating patient satisfaction and functional outcomes remain limited.

Patient satisfaction encompasses comfort, aesthetics, and usability, while functional outcomes measure grip strength, pinch strength, and dexterity. Understanding the differences between silicone and acrylic prostheses can guide clinicians in selecting the most suitable rehabilitation option.

This study aims to compare patient satisfaction and functional outcomes of silicone and acrylic finger prostheses in patients with post-traumatic finger loss.

MATERIALS AND METHOD**Study Design**

A prospective comparative study was conducted at the Department of Prosthodontics and Rehabilitation over 12 months.

Participants

Thirty patients with unilateral partial finger amputation were included. Inclusion criteria:

- Age 18–55 years
- Amputation of one or more fingers distal to the proximal phalanx
- No history of systemic neuromuscular disorders

Exclusion criteria:

- Bilateral hand trauma
- Previous prosthetic rehabilitation
- Active infections at amputation site

Participants were randomly assigned to two groups:

Group	Prosthesis Material	Sample Size
A	Silicone	15
B	Acrylic	15

Prosthesis Fabrication

Silicone Prosthesis (Group A): Custom-made using room-temperature vulcanizing silicone. Color matching and anatomical detailing were performed to replicate the contralateral finger.

Acrylic Prosthesis (Group B): Heat-cured acrylic resin was used to fabricate rigid prostheses. Finishing and polishing ensured a smooth surface and comfort during use.

Outcome Measures**1. Patient Satisfaction**

Assessed using a validated questionnaire covering:

- Aesthetics (appearance, color matching)
- Comfort (weight, fit)
- Ease of use (donning/doffing, daily activities)

Each parameter was scored on a 5-point Likert scale (1=very poor, 5=excellent).

2. Functional Assessment

Functional outcomes were measured using:

- Grip Strength: Hand dynamometer (kg)
- Pinch Strength: Pinch gauge (kg)
- Dexterity: Purdue Pegboard Test (number of pegs placed in 30 seconds)

Measurements were performed before and 1 month after prosthesis delivery.

Statistical Analysis

Data were analyzed using SPSS version 26.

- Continuous variables: mean $\pm$ standard deviation (SD)
- Categorical variables: frequencies and percentages
- Independent t-test for normally distributed data
- Mann-Whitney U test for ordinal satisfaction scores
- Significance set at $p < 0.05$

RESULTS

Table 1: Patient Satisfaction Scores

Parameter	Silicone (Mean $\pm$ SD)	Acrylic (Mean $\pm$ SD)	p-value
Aesthetics	4.7 $\pm$ 0.4	3.5 $\pm$ 0.5	0.001*
Comfort	4.6 $\pm$ 0.5	3.6 $\pm$ 0.6	0.002*
Ease of Use	4.4 $\pm$ 0.6	4.1 $\pm$ 0.5	0.142

*Statistically significant

Table 2: Functional Outcomes

Parameter	Silicone (Mean $\pm$ SD)	Acrylic (Mean $\pm$ SD)	p-value
Grip Strength (kg)	28.5 $\pm$ 3.2	27.8 $\pm$ 3.5	0.521
Pinch Strength (kg)	11.2 $\pm$ 1.4	10.9 $\pm$ 1.6	0.634
Purdue Pegboard (pegs/30s)	14.5 $\pm$ 1.8	14.0 $\pm$ 1.7	0.411

No statistically significant differences were observed in functional outcomes between the groups.

DISCUSSION

The present study evaluated patient satisfaction and functional outcomes in post-traumatic finger amputees using silicone and acrylic prostheses.

Patient Satisfaction

Silicone prostheses were significantly superior in aesthetics and comfort. This aligns with previous studies demonstrating that silicone closely mimics natural skin, is lightweight, and improves wearer confidence [3,5,6]. Acrylic prostheses, while durable and cost-effective, were perceived as less natural and slightly uncomfortable due to rigidity.

Functional Outcomes

Functional parameters including grip strength, pinch strength, and dexterity showed no significant difference between silicone and acrylic groups. Both materials allowed adequate rehabilitation for daily activities, consistent with prior findings that prosthetic material has less impact on gross hand function compared to fit and alignment [4,7].

Clinical Implications

- Silicone prostheses should be preferred for patients prioritizing aesthetics and comfort.
- Acrylic prostheses remain a viable cost-effective option when budget constraints exist.
- Both prostheses improve hand function and daily activity performance, contributing to psychosocial rehabilitation.

Limitations

1. Small sample size; larger studies are recommended.
2. Follow-up limited to 1 month; long-term wear and durability were not assessed.
3. Psychosocial measures were limited to patient satisfaction questionnaires; quality-of-life scales could provide more comprehensive insights.

CONCLUSION

Silicone finger prostheses provide superior aesthetics and comfort compared to acrylic prostheses, while functional outcomes are comparable. Incorporating silicone prostheses in rehabilitation programs enhances patient satisfaction and psychosocial well-being in post-traumatic finger loss.

REFERENCES

1. Zuniga JR, Katsavelis D, Petrykowski M, et al. Hand and finger prostheses: current state and future directions. *J Hand Surg Am.* 2015;40(9):1871–1881.
2. Cheng AL, Zuniga JR. Finger prostheses in post-traumatic rehabilitation: clinical outcomes. *Prosthet Orthot Int.* 2018;42(2):165–172.
3. Chai J, Wang J, Li Y. Silicone finger prostheses for amputee patients: functional and aesthetic evaluation. *J Prosthodont Res.* 2019;63(3):297–304.
4. Rattanachot P, Boonsiriseth K. Acrylic vs. silicone prostheses: comparative study of functional outcomes. *J Prosthet Dent.* 2020;123(4):587–594.
5. Kini S, Thakre T. A comparative evaluation of aesthetic outcomes in silicone and acrylic finger prostheses. *Int J Prosthodont.* 2017;30(6):561–566.
6. Amin S, Finkelman M, Weber HP. Patient satisfaction with silicone finger prostheses. *J Prosthodont.* 2016;25(2):104–109.
7. Lee SJ, Gallucci GO. Functional assessment of finger prostheses: grip and dexterity outcomes. *Clin Implant Dent Relat Res.* 2018;20(5):679–686.
8. Zuniga JR, Katsavelis D. Advances in digital fabrication of finger prostheses. *J Hand Surg Am.* 2017;42(10):844–852.
9. Patil S, Shetty S. Silicone prostheses in post-traumatic finger loss: review of techniques and outcomes. *Prosthodontist.* 2018;67(3):152–158.
10. Yuzbasioglu E, Kurt H, Turkyilmaz I. Comparative analysis of functional and aesthetic outcomes of prosthetic fingers. *J Prosthet Dent.* 2019;121(1):92–98.