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Reusable Fiberglass and Polyester Combined Total Contact Cast System for Treatment of Plantar Diabetic Foot Ulcers: Efficacy and Cost-Effectiveness

Diabetic foot ulcers (DFUs) remain a major cause of morbidity, healthcare expenditure, and amputation risk worldwide. Off-loading through total contact casting (TCC) is considered the gold standard, yet conventional systems are often limited by cost, patient adherence, and logistical challenges. This study evaluated the efficacy and cost-effectiveness of a reusable fiberglass and polyester combined TCC system in the treatment of plantar DFUs. A retrospective review of 70 patients treated between January 2020 and September 2022 demonstrated that 53 patients (75.7%) achieved complete wound closure, while 17 did not heal; among these, 9 required minor amputations and 1 underwent major amputation. Healing rates were consistent across ulcer locations, and outcomes were comparable to traditional TCCs, while offering significant economic advantages. These findings align with recent advances in DFU care, including regenerative medicine approaches, bioengineered tissue allografts, and emerging smart off-loading devices, which collectively aim to enhance healing potential and reduce recurrence. Current literature emphasizes the importance of integrating pressure redistribution, infection control, and patient-centered adherence strategies to optimize outcomes. In this context, the reusable hybrid TCC system represents a practical innovation bridging efficacy with affordability, particularly relevant for resource-constrained settings. Future research should focus on hybrid designs that improve patient comfort and adherence, while exploring synergies with novel adjunctive therapies. In conclusion, reusable fiberglass-polyester TCCs provide a cost-effective, clinically effective solution for DFU management, contributing to the evolving landscape of wound care innovation.

Biography

Dr. Alper Erkin is an Associate Professor of Cardiovascular Surgery at Kocaeli Academy Hospital and Managing Director of its Wound Clinic. He specializes in chronic wound management, diabetic foot care, vascular interventions, and regenerative therapies. With extensive experience in surgical off-loading, endovenous and endoarterial procedures, he has contributed to national and international congresses as an invited speaker. His research focuses on cost-effective wound care innovations, perfusion assessment, and integration of traditional and modern approaches. Dr. Erkin is dedicated to advancing patient-centered strategies and fostering interdisciplinary collaboration in vascular and wound management.