PRIZE O3

Optimising the offloading properties of the total contact cast

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Objective: Total contact casting is referred to as the gold standard offloading treatment for plantar foot ulceration, but the optimal technique and preferred materials are poorly defined and not readily prescribed in daily practice. In a repeated-measures laboratory controlled trial, we investigated in-cast plantar pressure offloading in two types of total contact casts vs. a control condition, during walking in patients with a plantar foot ulcer. **Research Design and Methods:** Plantar pressures were collected using the Novel Pedar-X system during walking in 20 participants with a plantar foot ulcer in two types of total contact casting techniques: standard total contact cast and a cushion-modified total contact cast incorporating an inlay of 6mm slow-rebound cellular urethane and 6mm soft cellular urethane vs. a canvas cast shoe to establish baseline pressure values. **Results:** Compared with the control condition, the standard total contact cast significantly reduced peak plantar pressure at the ulcer site by 44%, mean pressure by 47% and pressure-time integral by 37% ($p<0.001$), while the modified total contact cast significantly reduced peak plantar pressures at the ulcer site by 70%, mean pressure by 60% and pressure-time integral by 69% ($p<0.001$). The modified total contact cast was well tolerated. **Conclusion:** The offloading properties of the total contact cast can be optimised with an inlay of 6mm slow-rebound cellular urethane and 6mm soft cellular urethane modification. Further well-designed trials are required to understand and validate the cast technique, to demonstrate healing rates and efficacy in different patient groups. Furthermore a consensus among key opinion leaders needs to establish the preferred technique of contact casts. A consensus should encourage education programmes to make the contact cast technique more assessable to clinicians and in turn to patients.