



Catastrophic Fracture of Zirconia Full-Arch Implant-Supported Prostheses: A Systematic Review

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Purpose

Little is known about the fracture of Zirconia Complete-Arch Implant-Supported Prostheses (ZCAIP). This systematic review aimed to investigate the association between catastrophic fracture of ZCAIPs and specific dimensional and design parameters.

METHODS

A systematic electronic search of the PubMed database was conducted to identify clinical studies published in English from 2010 to 2026 that reported outcomes of complete-arch implant-supported zirconia dental prostheses.

RESULTS

45 studies met the inclusion criteria, documenting 7450 prostheses. 87 catastrophic fractures were reported over a mean followup period of 2.7 years. Time-to-fracture was reported in 21 cases for a mean of 14.7 months. 17.2% of all reported fractures involved a screw access channel and 13.8% involved a connector. 33.3% were accompanied by photos or descriptive details. 17.2% were located at the midline and 6.9% at the distal cantilever. 59% were of unknown modality and location. Dimensions of only 5 fractured prostheses were reported.

CONCLUSION/DISCUSSION

Details relevant to prosthesis design and clinical scenarios surrounding fractures were infrequently and inconsistently documented across studies. No definitive association with dimensional parameters could be established. These findings underscore the need for rigorous, well-designed clinical studies to quantify dimensional risk factors and to inform guidelines for ZCAIP fabrication.

