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The predictability of three implants to support a fixed prosthesis in the edentulous mandible

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Introduction: The use of four or more implants to support a fixed prosthesis in the edentulous mandible is well documented with high levels of clinical outcomes recorded. Despite this, the use of a three-implant supported fixed prosthesis offers the potential to deliver a more cost-effective method of oral rehabilitation in the lower arch; an important consideration given that edentulism is most prevalent in low-income subpopulations. The purpose of this study aimed to evaluate the implant and prosthetic survival rate, changes in marginal bone level, and patient satisfaction associated with a three-implant supported fixed prosthesis for rehabilitation of the edentulous mandible over a follow up period of at least one year.

Methods: A comprehensive literature search was performed to evaluate studies that met the selection criteria. The information extracted included the study design and population, participant demographics, observation period, loading protocol and the number of implants placed together with the required outcome measures. Mean values and standard deviations (SD) were calculated using SPSS® (IBM Corporation, New York, USA), and the level of statistical significance across all comparative studies described was set at $P < 0.05$.

Results: The eligible studies included a total of 1968 implants that were placed in 652 patients. The subjects ranged in age from 33-89 years with a mean of 63.2 years. The mean cumulative implant and prosthetic survival rates were 95.5% and 96.2% respectively over a mean follow-up period of 3.25 years. The mean marginal bone loss recorded was 1.04 mm and high patient satisfaction rates were reported across the studies.

Conclusion: Current evidence suggests that a three implant-supported fixed prosthesis for the edentulous mandible is a successful treatment strategy presenting high implant and prosthetic survival rates over the short-to-medium term. Further well-designed controlled clinical trials are required to evaluate longer-term outcomes, with supplemental data correlating implant dimensions and prosthetic design.