



# The Predictability of Three Implants to Support a Fixed Prosthesis in the Edentulous Mandible

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## Introduction

To use of four implants or more implants to support a fixed prosthesis in the edentulous mandible is well documented with high levels of outcomes recorded. Despite this predictability, the use of a three implant supported fixed prosthesis offers the potential to deliver a more cost-effective method of oral rehabilitation; 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, marginal bone levels, and patient satisfaction associated with a three-implant supported fixed prosthesis for rehabilitation of the edentulous mandible over a minimum follow up period of one year.

## Methods

A comprehensive literature search was performed to evaluate studies that met the selection criteria. The inclusion criteria for selecting articles were: case series, retrospective and prospective studies, and randomised controlled trials reporting on human subjects with a minimum follow up period of one year. The exclusion criteria included: animal studies, in vitro studies, case reports, commentaries and letters of correspondence, in addition to any studies with insufficient data reporting on the outcome measures of interest.

## Results

### Implant Survival

Implant survival ranged from 90.5%-100% with a mean cumulative survival rate of 95.5% (SD 2.66) at a mean follow up period of 3.25 years. This was found to be comparable to previous systematic reviews reporting survival rates for the use of four implants supporting a fixed prosthesis in the edentulous mandible over a similar period.

### Prosthetic Survival

Prosthetic survival ranged from 85%-100% with a mean cumulative prosthetic survival rate of 96.2% (SD 3.81) at the end of the follow up period with prosthetic failures related to implant loss. Although a relatively high survival rate was reported, limitations of this technique were highlighted by the fact that failure of one implant resulted in the prosthesis being condemned.

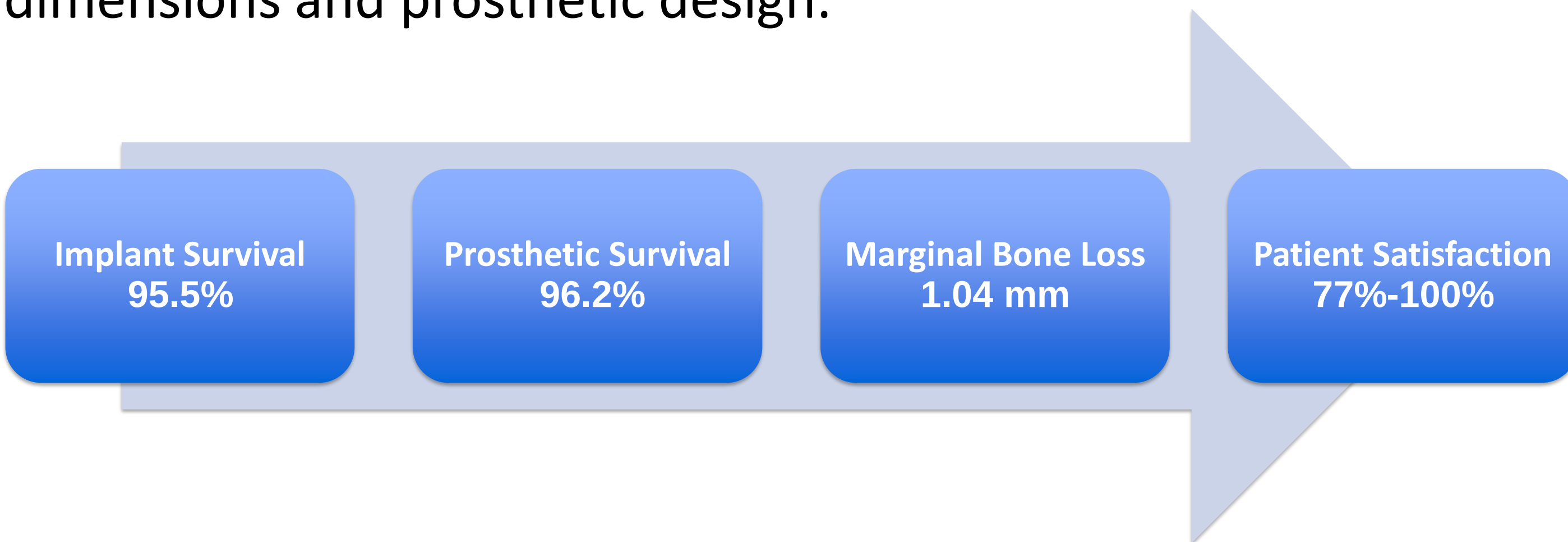
### Marginal Bone Loss

Marginal bone loss ranged from 0.24 mm to 2.38 mm over a follow up period of 1-16 years. Based on the studies included in this review, the cumulative mean marginal bone loss recorded was 1.04 mm (SD 0.64). The majority of peri-implant marginal bone loss occurred during the first year following prosthetic loading, in keeping with previously published meta-analysis.



## Conclusions

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.



## Conclusions

- Esposito M, et al. The effectiveness of immediate, early, and conventional loading of dental implants: a systematic review. Int J Oral Maxillofac Implants. 2007;22:893–904.
- Heydecke G, et al. What is the optimal number of implants for fixed reconstructions: a systematic review. Clin Oral Implants Res. 2012;23:217–228.
- Moraschini V, et al. Evaluation of survival and success rates of dental implants in longitudinal studies: a systematic review. Int J Oral Maxillofac Surg. 2015;44:377–388.