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Maxillary posterior implant as a surveyed crown for implant-assisted removable partial denture: A case report with 10-year follow-up

Discomfort, instability, and retention issues are common drawbacks of distal extension removable partial dentures (RPD).[1] An implant-assisted removable partial denture (IARPD) can offer a cost-effective and reliable prosthetic solution for partially or fully edentulous patients who may not be immediate candidates for extensive fixed implant-supported restorations.[2] Lack of distal abutments usually request fully coverage of hard palate to increasing support and stability of maxillary denture. Considering implant placement during treatment planning for distal extension RPDs is advisable. A notable incidence of implant loss and technical complications occurred with maxillary overdentures.[1] The adoption of surveyed crowns for implant-assisted maxillary removable partial dentures (IARPDSC) has been limited due to concerns regarding lateral forces and high stress concentrations, which could potentially jeopardize implant stability, contribute to marginal bone resorption, and ultimately lead to implant failure.[3] Long-term reports on the use of IARPDSC as distal abutments for maxillary free-end saddle dentures are rare. The aim of this report was to present the 10-year, long-term outcomes of a case adopting IARPDSC in treatment of maxillary free-end partial edentulism.

A 58-year-old female patient with a Kennedy Class I partial edentulous maxillary arch was referred to the Periodontal Clinic of Taipei Tzu Chi Hospital in 2013 for implant assessment (Fig. 1A). Teeth #21 and #23 were extracted due to poor prognosis and esthetic concerns. Implants were placed and restored at positions #14 and #17 (6 × 10 mm), aiming to transition the RPD from Kennedy Class I to a more favorable Kennedy Class III (Fig. 1B). Implant crowns were fabricated 5 months after implant placement. Horseshoe major connector was designed due to prominent palatal median suture. I-bars at implants #14 and #23 and circumferential clasps at implants #17 and #26 were used to provide RPD retention (Fig. 1C). The opposing edentulous arch received 4 implants and was also restored with an IARPD. Occlusal equilibration was carefully conducted to ensure even contact of dentition in centric occlusion and provide balancing contacts during function. Recall visits for professional cleaning and oral hygiene reinforcement were scheduled every 3 to 6 months. Ten years after denture delivery, clinical and radiographic examinations were documented (Fig. 1D). Minimal marginal bone loss (0.3 mm) and no marginal tissue recession was noted at implant #17. Over the 10-year follow-up period, no biological or mechanical complications were observed with implant #17 and the upper IARPD.

The long-term stable bone level around the distal free-end implants in IARPD in this report is an encouraging finding, likely attributed to proper occlusal scheme, optimal denture design, and strict maintenance program provided for these patients.[4,5] However, in the maxilla or in cases of alveolar bone with poor bone quality, 2 or more implants are highly recommended. These implant-surveyed prostheses should be splinted to distribute peri-implant bone stress. Otherwise, long and/or wide-diameter implants should be considered if a single implant is placed at the distal free-end as a surveyed crown for the IARPD. The findings from this long-term case report suggest that maxillary IARPDSC can achieve good long-term results in carefully selected and well-maintained populations. Patients should be informed about their role in maintenance, and a comprehensive recall system is essential for achieving satisfactory long-term outcomes. Furthermore, advocating for further long-term multi-center controlled clinical trials with a greater number of patients is crucial to ensure the reliability of IARPDSC.

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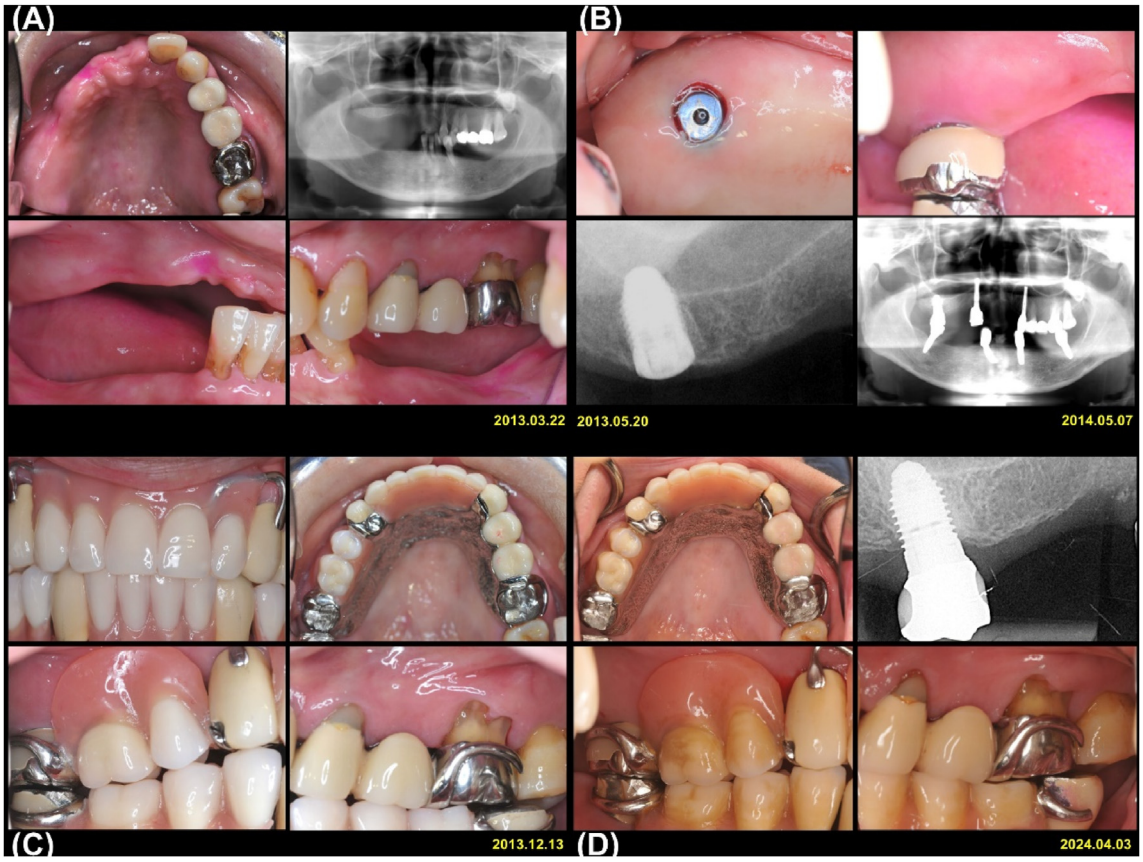

Figure 1 Clinical photographs and radiographs of our patient. (A) A 58-year-old female patient with a Kennedy Class I partial edentulous maxillary arch. (B) Implants were placed and restored at positions #14 and #17 (6 × 10 mm), aiming to transition the removable partial denture (RPD) from Kennedy Class I to a more favorable Kennedy Class III. (C) Horseshoe major connector was designed due to prominent palatal median suture. I-bars at implants #14 and #23 and circumferential clasps at implants #17 and #26 were used to provide RPD retention. (D) Ten years after denture delivery, clinical and radiographic examinations revealed the minimal marginal bone loss and minimal marginal tissue recession at implant #17.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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