

# Treatment of edentulous patients with SR Phonares®

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Despite the decline in the proportion of edentulous patients, continued population growth and greater longevity of older patients will increase the need for dental services for these patients in the foreseeable future. Furthermore, this elderly and edentulous population is showing a growing demand for lifelike, esthetic restorations.

Patients are often dissatisfied with removable complete dentures. Implants provide a solution in such cases. A mandibular overdenture supported by as few as two implants, for example, offers a viable alternative. The treatment of edentulous patients with endosseous implants has almost become a routine procedure. In fact, the McGill Consensus has established the two-implant mandibular overdenture as a standard of care. Typically, maxillary implant prostheses entail more complexity and expense than those for edentulous mandibles. Preliminary results from at least one study, however, indicate that a

maxillary overdenture supported by four independent implants may demonstrate predictable longevity, thus reducing the cost and difficulty in maxillary implant reconstruction (Figs 1 to 4). Patients were similarly satisfied with both fixed and removable implant-supported prostheses in the edentulous maxilla. Therefore, this solution for edentulism in the maxilla and mandible has become the treatment of choice for a large segment of the edentulous population.

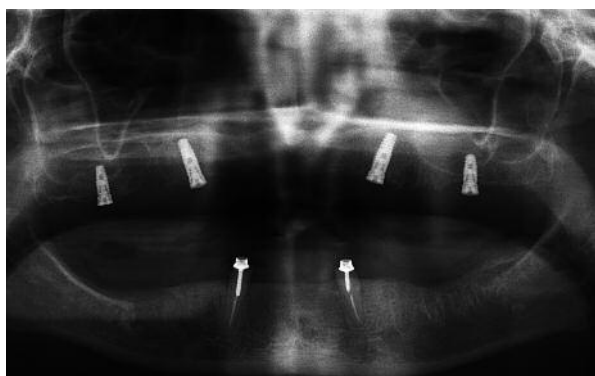
## Denture teeth and the potential of new materials

A major challenge with conventional denture teeth in implant prostheses is the lack of durability. Although implant and prosthesis survival rates remain high in edentulous patients, a significant prosthetic problem has been wear and fracture of resin denture teeth. One study showed that fractures of resin teeth were the next most common complication, after speech problems. Another study that demonstrated high success rates with four-implant overdentures reported fracture of acrylic components (including denture teeth) in 14 percent of total cases. One reason for the reported incidence of denture tooth fracture is higher occlusal forces in implant denture wearers than those in conventional denture wearers. In a Medline review, Goodcare et al. reported an incidence of resin veneer fracture of implant fixed partial

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**Figure 1:** X-ray of a 62-year-old female patient. Four implants had been inserted in the edentulous maxillary arch.



**Figure 2:** Clinical picture showing the implants distributed around the maxillary arch.



**Figure 3:** The implant-supported denture made with Phonares teeth.



**Figure 4:** The patient was extremely pleased with her renewed smile and secure prosthesis.

dentures of 22 percent. Other investigations have also reported a high frequency of denture tooth fracture in implant prostheses for edentulous patients. Similarly, ceramic prostheses are more prone to fracture on implants than on tooth-supported restorations (Fig 5). Implant prostheses with resin denture teeth, however, are easier and less costly to repair than those with ceramic teeth.

Recently developed denture teeth composed of nanofilled composite resin demonstrated more wear than ceramic teeth, but less than that of acrylic resin teeth. Composite/resin teeth seem to be more suitable for prostheses opposing natural teeth than ceramic teeth in terms of wear resistance. An in vitro study has confirmed this finding. Traditional resin denture teeth, however, have two shortcomings:

1. Conventional resins do not replicate light and optical

properties of teeth as closely as ceramic compositions.

2. The anatomical form of denture teeth is often deficient.

Tooth loss has been found to be not only a physical disability; but the loss of confidence related to an altered appearance can be an emotionally traumatic experience as well (Fig 6). The esthetic aspect of complete edentulism, therefore, has a profound impact on overall patient satisfaction (Figs 7 to 8b). As a result, clinicians should also continue to direct their efforts towards enhancing esthetics for edentulous patients treated with implant prostheses.

#### **Potential of Phonares**

Phonares denture teeth manufactured by Ivoclar Vivadent have been designed to overcome the obstacles of



**Figure 5:** *Not a nice sight: The patient was unhappy with the restoration which demonstrated significant wear.*



**Figure 6:** *Worn denture teeth negatively affected the facial appearance of a 59-year-old female patient.*

traditional denture tooth durability and esthetics. They are constructed from nano-hybrid composite (NHC) that contains macro-fillers for strength and colour stability, micro-fillers for wear resistance, nano-fillers for translucency and polymethyl methacrylate (PMMA) for bonding and toughness. Tooth-like translucency is achieved from the small filler particle size that improves the refractive index of Phonares teeth. Individualized layering gives these teeth a natural-looking colour. Contemporary moulds, based on age, shape and size facilitate the selection process in the fabrication of the restoration. The anatomical occlusal form of the posterior moulds corresponds to functional principles and simplifies the arrangement of either lingualized or natural occlusal schemes. Palatal and lingual contours are complete, therefore allowing festooning that more closely mimics natural sulcular sculpting. The unique interproximal “set and fit” design of the maxillary anterior teeth provides for easy overlapping of tooth surfaces without creating widened interproximal spaces. Broadened cervical tooth contours are conducive to fitting over implants, abutments and screw access openings.

My experience with Phonares denture teeth has been very positive. Using Phonares denture teeth, anatomical festooning and customized gingival acrylic resin, the esthetic outcomes have been on a par with more costly and complex implant-supported all-ceramic prostheses. In the past, anatomically incorrect and deficient contours of traditional denture teeth resulted in festooning that did not mimic natural soft tissue profiles. Overlapping proximal tooth surfaces for more lifelike tooth arrangements and narrow or reduced tooth necks often resulted in open proximal spaces. Lingual and palatal

contours that did not extend apically made gingival festooning lacking in these areas.

Phonares teeth are conducive to anatomical papilla and sulcular festooning more appropriate for mature patients. Laboratory technicians may now modify their waxing techniques to reflect these improvements (Figs 9 and 10). The “set and fit” proximal surfaces allow slight overlapping, while maintaining tight proximal contacts (Figs 11 and 12). Tooth necks are wider and more anatomical, which minimizes proximal spacing and eliminates excess papillae heights. Lingual and palatal festooning can mimic natural soft tissue by following the complete anatomical form of Phonares teeth (Fig 13). Improved moulds and seamless individualized layering of the nano-hybrid composite resin teeth enhance esthetics even more (Fig 14). My patients have been very accepting of the youthful and vibrant translucent light qualities and colour gradations of Phonares teeth.

### Conclusions

Phonares teeth offer superior esthetics and durability to implant prostheses for edentulous patients. Although implants have been extremely successful for edentulous patients, prosthetic maintenance has been problematic due to wear and fracture of denture teeth. The innovative composition of Phonares denture teeth should provide greater durability and longevity, resulting in fewer prosthetic revisions for implant prostheses. The lifelike moulds and optical properties of Phonares denture teeth impart an appearance that is nearly indistinguishable from natural teeth. They are a significant development in enhancing implant treatment outcomes for edentulous patients.



*Figure 7: Phonares denture teeth were used to construct a new maxillary denture for this female patient.*



*Figures 8a and b: A more youthful smile and the confidence of the patient were restored.*



*Figure 9: The patient received a maxillary and a mandibular denture. The lifelike optical properties of Phonares teeth pleased not only the patient, but us as well.*



*Figure 10: Phonares teeth are conducive to anatomical papilla and sulcular festooning more appropriate for mature patients. Laboratory technicians may now modify their waxing techniques to reflect these improvements.*



*Figure 11: The maxillary failing anterior teeth of this male patient were significantly overlapped.*



*Figures: 12 and 13 Maintaining some semblance of the overlapped teeth required no proximal modification of the Phonares denture teeth.*



*Figure 11: The maxillary failing anterior teeth of this male patient were significantly overlapped.*

A list of literature references is available on request from the editors.

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