Ovoid pontic design through gingival contour.
Report of two cases

Diseño de póntico ovoide mediante contorno gingival.
Reporte de dos casos clínicos

Reyes Moreno G,* Rios Szalay E§

* Graduate, Oral Prosthesis Specialty, Graduate School and Research Division, National School of Dentistry, National University of Mexico.
§ Professor, Oral Prostheses Department, Graduate School and Research Division, National School of Dentistry, National University of Mexico.

Received: 3 November 2005.
Accepted: 9 April 2010.

Este artículo puede ser consultado en versión completa en http://www.medigraphic.com/facultadodontologiaunam

ABSTRACT

Collapse in the anterior maxillary region is one of the most frequently found problems in patients who have endured extractions, especially in zones which represent a great aesthetical challenge. Treatment is often administered lacking proper case planning, and therefore might originate very important defects in the alveolar process periodontal architecture. There are periodontal and prosthetic techniques which can solve this type of situations. The use of ovoid pontics combined with periodontal plastic surgery techniques is mainly administered to patient rehabilitation, and can achieve satisfactory functional and aesthetic results. The purpose of this study was to show two clinical cases where both techniques were used. In the first clinical case, a fixed partial prosthesis of three ceramic units In-Ceram® devoid of metal was manufactured, using the ovoid pontic technique. In the second case, a Maryland type prosthesis of optimized ceramic polymer reinforced with fiber glass was fabricated. The prosthesis contained an ovoid pontic combined with a subepithelial connective tissue graft to reconstruct the periodontal architecture of the alveolar process in the zone of the missing tooth. Results thus achieved give a natural, aesthetic and functional appearance to the prosthesis pontics.

Key words: Ovoid pontic, plastic periodontal surgery, aesthetics.

Palabras clave: Póntico ovoide, cirugía plástica periodontal, estética.

INTRODUCTION

Prosthetists frequently face the complex challenge of substituting teeth in edentulous areas, where the pontic shape must fulfil functional, periodontal and aesthetic requirements. Treatments carried out with no proper former case planning cause important defects in the periodontal architecture of the alveolar process, as mentioned by Herbert1,2 and Seibert,3 who provide a classification of these defects. There are many shapes of pontics to choose from, the right selection for each case will have significant bearing on a better prognosis and final result of the treatment. Pontics have been classified4,5 and can be selected according to the particular case. The classification is as follows:

1. Saddle ridge lap
2. Modified saddle ridge lap
3. Flute peak
Figure 1. Initial stage, clinic case number 1, patient presents a three unit metal-acrylic prosthesis as well as fibrosis around the prosthesis area, due to the maladjustment of the prosthesis.

Figure 2. Gingival niche four weeks after healing and final preparation of abutment teeth before taking the impression.
Provisional prosthesis was applied. For this purpose a silicon guide was used, taken before a diagnostic waxing, so as to have the patient ready for the periodontal surgery. The gingivoplasty of the anterior maxillary area was performed with a number 11 scalpel blade, and slice cuts were carried out. Once the desired periodontal architecture contour was achieved, the provisional prosthesis was augmented through the use of Jet (Lang) acrylic® into the mouth. It was trimmed, perfectly polished and provisionally cemented with Tempbond® cement. Finally, a surgical pad was applied to the area and a healing time of 5 months was observed. During this healing period general periodontal treatment was maintained. Once the healing came to its term, the teeth were once more prepared. With a diamond bur shaped like an American football, a 2 to 3 mm niche was prepared in the gum of the edentulous area. This procedure was carried out with the purpose of creating over the gum the gingival contour for an ovoid pontic. A three week healing period was observed. The provisional prosthesis was once again put in place. This provisional prosthesis had previously received self-curing acrylic at the base of the pontic to simulate the shape of the niche. The gum was allowed to heal for 3 to 4 weeks (Figure 2). After this period, an impression was taken for the manufacture of the final prosthesis with the use of PVS (polyvinyl siloxane).

The manufacture of the In Ceram® prosthesis was carried out in two phases: sintering and infiltration. With these processes a substructure of aluminium foil reinforced with zircon glass was established to confer resistance and hardness to the final product. Once the In-Ceram core was obtained, the substructure was ready for the placement of the Vita alpha type dental ceramic. Once the prosthesis was finished, it was tried in the mouth and shape, marginal proximal and incisal contours, texture and marginal sealing were assessed.

There are many criteria for selecting a cement. Conventional cements can be used, such as zinc phosphate, polycarboxilate, resin based cements31 and glass ionomers.32-34 This last one, due to its constant evolution, is highly recommendable: it performs an excellent chemical bond to dentin, presents low solubility to oral fluids, and shows cariostatic properties through its constant release of fluoride. An important characteristic to be taken into consideration is the bonding capacity of the cement to the ceramic system as well as to the remaining tissue and its excellent behaviour when in contact with humidity (Figure 3).

With the use of both periodontal and prosthetic techniques the result is a natural appearance fixed partial prosthesis, which creates the illusion of the pontic emerging through the gum. The use of the ovoid pontic technique allows for functional and favorable aesthetics.

CLINICAL CASE NUMBER 2

Maryland type prosthesis made of optimized ceramic polymer reinforced with glass fiber. The patient was a 14 year old male student. He presented absence of tooth 11 (Figure 4) due to trauma from a bicycle accident sustained approximately one year before. The patient used as provisional prosthesis a Hawley type retainer. Upon clinical examination, the patient showed moderate gingivitis around the cervical area of the teeth. The edentulous area presented a slightly reduced space in mesiodistal direction for the proper aesthetic manufacture of the prosthesis. Nevertheless, due to the extraction, a collapse of the bone table in vertical and vestibular-palatine direction could be observed.

Treatment plan originally contemplated rehabilitation through a dental implant, but for financial reasons...
this option was discarded. The patient requested a fixed prosthesis, and to preserve his abutment teeth as intact as possible. Therefore, a Maryland type prosthesis was selected, since one of its main indications is a conservative way of dental surface wear, another characteristic of these prostheses is to be able to count with metal free systems for the building of the prosthesis. Prior to the construction of the prosthesis a subepithelial connective tissue graft was placed, for the reconstruction of the defect in the edentulous area of the alveolar process. Once the treatment plan was chosen, periodontal surgery was performed. In this surgery, a flap was raised to uncover the defect zone. A portion of subepithelial connective tissue from the palatine area was taken and placed over the defect area. The flap was sutured and covered with a surgical pad as well as the donor area of the palate. Finally a Hawley type retainer was placed to protect both areas. A healing period of 5 months was observed during which time the treatment was continued. Once the graft healing period had elapsed, a 2.5 mm deep gingival niche in the edentulous zone was built (Figure 5) with an American football shaped diamond bur to obtain the desired gingival contour for the ovoid pontic.

A Maryland type design acrylic provisional prosthesis was placed with the aim of simulating the shape of the gingival niche just manufactured. This provisional appliance was adhered with resin, following conventional technique, to obtain temporary results. Once the healing of the gingival niche was completed, an ameloplasty was performed in the mesial area of teeth 12 and 21, to obtain a more appropriate mesio-distal width in the elaboration of the prosthesis. Impression was taken with PVS, and a record was taken with a facial arch (Hanau) to obtain maxillary occlusal plane relationship. Once the master model and the antagonist were obtained, the procedures for the prosthesis elaboration were carried out following the Targis/Vectris® system. This system uses a glass fiber substructure as well as optimized ceramic polymer. This material allows for good aesthetic and functional results and offers an appropriate security margin for treatment success. Once the prosthesis was finished, it was placed into the mouth, and shape, incisal, marginal and proximal contours were assessed. Texture, color and marginal fit were equally evaluated. With adhesion in mind, cementation was performed with the Variolink II system (Ivoclar, Vivadent)° recommended by the prosthesis elaboration system (Figure 6).

Results obtained with periodontal surgery for the reconstruction of alveolar process defect, offer the necessary circumstances for applying the ovoid pontic technique. It affords, through the gingival niche elaborated in the gum, the creation of the illusion of the pontic emerging from the periodontium. Associated to this, is the fact that through the metal free Targis/Vectris® system (optimized ceramic polymer) satisfactory functional and aesthetic results are obtained.

**DISCUSSION**

Patients increasingly demand natural looking oral restorations. It is therefore necessary to use all possible resources to obtain predictable functional and aesthetic results, especially in areas where aesthet-
ics is a priority. With the advent of new systems and dental materials for the manufacturing of prostheses, it is possible to attain the desired success; that includes satisfaction of the patient, the dentist and the dental laboratory through a precise diagnosis and proper intercommunication. Through experience accumulated with the passing of time in the use of the ovoid pontic as well as with periodontal plastic surgery techniques, aesthetic, functional and natural looking dental treatments can be achieved. Results obtained in these cases can support Dewey's work, through the use of radicular shaped prosthetic extensions inside the alveoli of recently extracted teeth, stated that there existed a connective tissue formation around the ceramic portion of the root shaped extensions, thus providing a natural and inflammation free appearance around the prosthesis. Studies by Vavazos, Constantidines, Dylina and Bowels were also in agreement. These studies assess gingival tissue under pontic moderate pressure, preserving the tissue health free from inflammation and allowing well the appearance of pontic emergence from the inside of the gingival tissue.

CONCLUSIONS

- Important aesthetic criteria related to periodontal techniques need to be taken into consideration in cases where there are defects in the periodontal architecture of the edentulous alveolar process so as to provide a prosthesis with natural and aesthetic appearance.
- The use of ovoid pontics is another oral rehabilitation technique that can be used in cases where aesthetics is a priority.
- Use of periodontal plastic surgery techniques to rebuild defective alveolar processes is an option within our reach to achieve satisfactory aesthetics results.
- Treatment through the use of ovoid pontic in some cases does not require surgical intervention. Therefore, the formation of a gingival niche with a round burr or a burr shaped as an American football does not represent an increase in treatment cost.

REFERENCES


Mailing Address:
Dr. Enrique Rios Szalay
E-mail: enriosza@servidor.unam.mx