Total rehabilitation of maxilla using a tooth-to-implant restoration: case report

Andrea Araujo de Vasconcellos, DDS, MS, PhD • Sergio Eduardo Henrique Feitosa, DDS, MS
Francisco Mauro da Silva Girundi, DDS, MS

Dental implants in partially edentulous patients are a predictable therapeutic option. However, using tooth-to-implant restorations to rehabilitate partially edentulous patients involves highly complex biomechanical aspects. This type of prosthesis utilizes different kinds of support that react distinctly to the functional forces developed in the oral cavity. In some cases, a tooth-to-implant restoration is a treatment option for difficulties related to reduced bone volume, inadequate interdental space, or an implant’s failure to osseointegrate.

This case report describes the rehabilitation of a patient whose partially edentulous maxilla was treated with a tooth-to-implant restoration. In this case, telescopic crowns were used to better match the tooth-implant union. No biomechanical or functional problems were found 8 years post-treatment, indicating that the combination of implant and tooth support is a possible treatment option with an improved long-term prognosis.

Received: September 12, 2012
Accepted: February 19, 2013

Case report

A 61-year-old man in good general health sought treatment at the prosthodontic clinic at the Institute for the Study of Health at Minas Gerais. The patient’s maxillary arch included provisional resin crowns on the remaining teeth and a temporary removable partial denture. The patient also had a removable partial denture in the mandibular arch (Fig. 1).

The evaluation of natural teeth included examination of their clinical status (based on endodontic treatment, fracture, and intrusion). To verify the periodontal health of the teeth, tooth stability, pocket depth, plague and bleeding indices, and calculus status were evaluated as well. The patient had healthy gingival tissues, and no mobility was observed. However, there was evidence of an invasion of the biological space and a need to increase the clinical crowns on the maxillary teeth.

The patient needed crown replacement and a fixed restoration, with implants placed in the edentulous posterior areas of the maxillary arch, and teeth placed in the posterior region of the mandibular arch.

Treatment options were discussed with the patient. In response to the patient’s request for a fixed restoration in the maxilla, it was decided to start with a radiographic evaluation in order to properly place implants and fabricate a fixed partial denture and implant-supported prostheses. The patient also wanted a new removable partial denture for the mandibular arch.

Fig. 1. An anterior view of provisional resin crowns on remaining maxillary teeth.
The patient had decreased vertical dimension. To help restore it, maxillary and mandibular records were made using an autopolymerizing polyacrylic (VIP Flash, VIP Industria, Comercio, Exportacao e Importacao de Produtos Odontologicos Ltda.). Metric, esthetic, phonetic, and physiological tests were performed to verify that the vertical dimension of occlusion was correct. To restore the horizontal position of the mandible, indentations were made in the posterior region of the upper register and acrylic resin was added to the lower register, causing the patient to occlude in a centric relationship (Fig. 2).

A study cast was fabricated and mounted on a semi-adjustable articulator with a facebow. The diagnostic wax-up was done in the established vertical dimension of occlusion, re-establishing the mutually protected occlusion; in addition, provisional maxillary restorations were fabricated (Fig. 3). A removable partial denture was made per the patient’s request. Later, the clinical crowns of the maxillary teeth were increased to restore the biological space, surgery was performed for maxillary sinus lifting, and a lyophilized bone graft was performed using a bone substitute (Geistlich Bio-Oss, Geistlich Pharma North America, Inc.). An implant was placed in the area corresponding to the right first premolar. After the postsurgical healing following the clinical crown surgery, the maxillary teeth were prepared for metalloceramic crown restorations. At that point, the provisional restorations were relined. Eight months after surgery for maxillary sinus lifting, an implant was placed in the area corresponding to the right first molar. During the implant osseointegration period, the stone dies of the prepared teeth and transfer copings were made with Duralay resin (Reliance Dental Mfg. Co.) (Fig. 4). The transfer copings were used to move the intraoral teeth and implant positions to the cast, position the abutments intraorally, and facilitate the fabrication of the fixed partial denture and implant-supported prostheses. However, during the transfer molding, it was discovered that the implant in the right first premolar area had failed to osseointegrate and was removed.

Since the patient did not want to undergo surgery to install the new implants at that time, a revised treatment plan was discussed. Taking into account the possibility of installing new implants in the future, a reversible treatment was planned, with the patient opting for a combination of natural teeth and dental implants. Telescopic crowns were cemented into the maxilla and a pillar prepared for a cemented crown was screwed onto the maxillary right first molar. Using a porcelain framework (Noritake Super Porcelain...
A 2004 case report by Wang et al proposed that placing a natural tooth over an 8-year period, indicating that the problem had to do with connector design in terms of the mechanical response (stress values and distribution) for implant systems and alveolar bone.

An implant and tooth-supported prosthesis is a viable alternative in some specific clinical conditions, as it allows the patient to have additional implants installed in the future. In addition, the whole structure of the prosthesis can be removed for implant installation without interfering with the cementation of crowns on the remaining teeth. A correctly planned and fabricated prosthesis can lead to satisfactory esthetic and functional long-term results.

**Summary**

The combination of an implant and tooth support from telescopic crowns is a treatment option for some partially edentulous patients. This system should be considered when an implant-supported fixed prosthesis cannot be used. Patients in this situation should be aware of possible complications and limitations, and know that follow-up treatment is required. The patient in the present case was fully satisfied because his functional and esthetic expectations were met.
Author information
Dr. Vasconcellos is a professor, Federal University of Ceara, Fortaleza, Brazil. Drs. Feitosa and Girundi are professors, Pontifical Catholic University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

References

Manufacturers
BEGO USA, Lincoln, RI
800.342.4346, www.begousa.com
Geistlich Pharma North America, Inc., Princeton, NJ
Kuraray America, Inc., New York, NY
800.879.1676, www.kuraraydental.com
Reliance Dental Mfg. Co., Worth, IL
708.597.6694, reliancedental.net
VIPI Industria, Comercio, Exportacao e Importacao de Produtos Odontologicos Ltda., Sao Paulo, Brazil