

# Magnet-Retained Facial Prosthesis Combined with an Implant-Supported Edentulous Maxillary Obturator: A Case Report

Tetsu Takahashi, DDS, PhD<sup>1</sup>/Masayuki Fukuda, DDS, PhD<sup>2</sup>/Katsuyuki Funaki, DDS<sup>3</sup>/Kiyoshi Tanaka, RDT<sup>4</sup>

*The prosthetic rehabilitation of maxillofacial defects is especially challenging when the patient is edentulous. Although dental implants are used to enhance the retention and stability of both facial and maxillary prostheses, combining facial and maxillary prostheses is extremely difficult. This article describes the prosthetic treatment of an edentulous patient with a large maxillary and facial defect. After placing dental implants in the remaining maxilla, a maxillary obturator prosthesis supported by a milled bar attachment was fabricated. The facial prosthesis was retained by a magnetic attachment to the maxillary obturator prosthesis. As the obturator prosthesis was supported securely by this sturdy attachment, the facial prosthesis was stable during mastication and facial movement. The patient reported improvement in prosthesis retention and stability. Both the masticatory and the speech functions of the patient improved. INT J ORAL MAXILLOFAC IMPLANTS 2006;21:805-807*

**Key words:** dental implants, facial prostheses, magnets, maxillary obturators, milled bar attachments

The prosthetic rehabilitation of maxillofacial defects in edentulous patients is challenging. Recently, a prosthesis supported by dental implants and bar attachments has been introduced for oral rehabilitation in edentulous patients who require maxillectomies.<sup>1-5</sup>

Mentag and associates<sup>1</sup> found that implants placed in the residual alveolar bone rather than in maxillary bone around the defect demonstrated increased retention and stability. Fukuda and colleagues<sup>4</sup> demonstrated that a maxillary obturator prosthesis supported by milled bar attachments markedly improved masticatory and speech functions of edentulous maxillectomy patients. However, when

the defects extend to the facial area as well as the maxilla, it is difficult to rehabilitate the facial defects simultaneously. In the case presented here, a magnet-retained facial prosthesis combined with an implant-supported edentulous maxillary obturator prosthesis was fabricated for a large maxillofacial defect.

## CASE REPORT

A 73-year-old edentulous woman was referred to Akita University Hospital for esthetic and functional rehabilitation of a facial defect. Two years earlier, she had undergone a maxillectomy because of squamous cell carcinoma. Simultaneous tissue reconstruction was carried out for a facial defect in her right infraorbital area. She had not undergone radiation therapy pre- or post-operatively. However, a large facial and maxillary defect had developed after total necrosis of the flap. Extraorally, there was a defect of the skin extending from the left alar base to the infraorbital region and the superior part of the cheek. Her left eye was displaced inferiorly because of a defect of the infraorbital rim.

Computerized tomography revealed a defect involving two thirds of the maxilla, the infraorbital rim, the zygomatic process, and the nasal conchae. Bone was observed in the remaining right maxilla. Initially, a maxillary obturator prosthesis and a sepa-

<sup>1</sup>Professor and Chairman, Division of Oral and Maxillofacial Reconstructive Surgery, Department of Oral and Maxillofacial Surgery, Kyushu Dental College, Kitakyushu, Japan.

<sup>2</sup>Lecturer, Division of Dentistry and Oral Surgery, Akita University School of Medicine, Akita City, Japan.

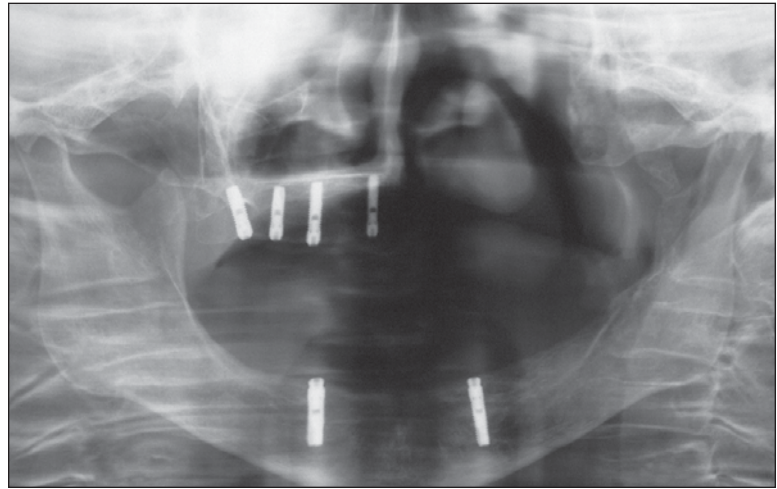
<sup>3</sup>Assistant Professor, Division of Oral and Maxillofacial Reconstructive Surgery, Department of Oral and Maxillofacial Surgery, Kyushu Dental College, Kitakyushu, Japan.

<sup>4</sup>Chief Registered Dental Technician, Division of Dentistry and Oral Surgery, Akita University School of Medicine, Akita City, Japan.

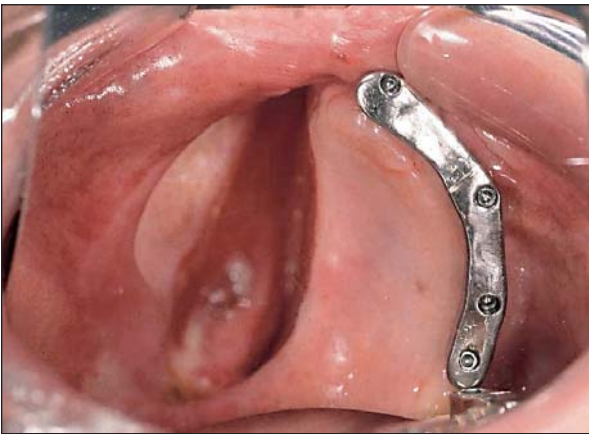
**Correspondence to:** Dr Tetsu Takahashi, Division of Oral and Maxillofacial Reconstructive Surgery, Kyushu Dental College, 2-6-1 Manazuru Kokurakita-ku, Kitakyushu 803-8580, Japan. Fax: +81 93 592 3056. E-mail: tetsu@kyu-dent.ac.jp



**Fig 1** Implant placement.



**Fig 2** Panoramic radiograph obtained after implant placement.



**Fig 3** The milled bar attachment fabricated on the abutments.



**Fig 4** A maxillary obturator prosthesis and implant-supported mandibular overdenture.

rate facial prosthesis were planned. A facial prosthesis was then fabricated from silicone (Silskin-Clear; Tharcray Surgery, Rhemny, UK), which was retained by a surrounding soft tissue undercut without any adhesive. However, the retention and stability of the obturator prosthesis was not acceptable to the patient. Therefore, a decision was made to fabricate a magnet-retained facial prosthesis combined with an implant-supported edentulous maxillary obturator with a milled bar attachment to improve retention and stability.

The implantation procedure was conducted under local anesthesia. A crestal incision was made, and four dental implants (two 3.5 × 11-mm and two 3.5 × 13-mm Astra Tech standard implants; Astra Tech, Mölndal, Sweden) were placed according to the manufacturer's instructions (Fig 1). In addition, two 3.5 × 13-mm Astra Tech implants were placed in the mandibular canine region bilaterally (Fig 2). Transmu-

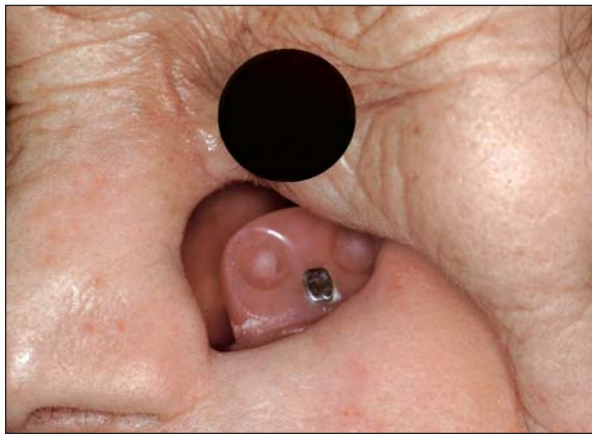
cosal abutments were placed after 6 months of undisturbed healing. Prosthetic treatment was then initiated. The milled bar attachment system was fabricated to fit the abutments (Fig 3), and a maxillary obturator prosthesis was placed. Simultaneously, a mandibular overdenture was fabricated. This prosthesis was retained by ball attachments that were connected to the mandibular implants (Fig 4). For the facial defect, a magnet-retained facial prosthesis was fabricated. Magnetic attachments (Magfit; GC Corporation, Tokyo, Japan) were placed on the superior portion of the maxillary obturator prosthesis. The ferromagnetic alloy keeper was enfolded in acrylic resin and then embedded in the silicone facial prosthesis (Silskin-Clear; Figs 5, 6, and 7). As the maxillary obturator prosthesis was firmly retained by the implant-supported dentures with a taper angle of 4 degrees to the milled bar attachments, and the facial prosthesis was attached to the maxillary obturator, the facial



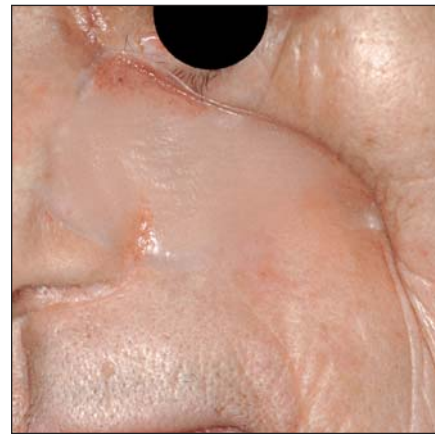
**Fig 5** The keeper was enfolded in acrylic resin and embedded in the facial prosthesis.



**Fig 6** The facial prosthesis attached to the upper part of the maxillary obturator prosthesis by a magnet attachment.



**Fig 7** The magnet attachment was seen on the upper part of the maxillary obturator.



**Fig 8** The final outlook of the patient wearing the facial prosthesis.

prosthesis could not come off during mastication or facial movement (Fig 8). The masticatory and speech functions of the patient, which were evaluated using the masticatory efficiency index<sup>6</sup> and the speech function index,<sup>7</sup> respectively, improved from preoperative levels. Five years after delivery of the implant-supported maxillary obturator, there has been no implant loss. There is no inflammation of the skin around the rim of the facial prosthesis. The mean marginal bone loss around the 4 implants between baseline and the first annual follow-up was 0.57 mm; it was 0.85 mm at the second year follow-up.

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