

# An implant-supported removable partial denture for a patient with post-inflammatory scar contracture caused by burn complications: a clinical report

Jee-Hwan Kim, DDS, MSD, PhD, Jae-Hoon Lee\*, DDS, MS, PhD

Department of Prosthodontics, College of Dentistry, Yonsei University, Seoul, Korea

The scars and contracture around the oral-facial region may cause difficulty in prosthodontic treatment to restore esthetics and function for the patients, who suffered severe burns. This article presents a technique that uses a fixed partial denture prepared with a conventional milling technique and an attachment to support anterior cantilever removable partial denture, thereby providing a more esthetically acceptable and functional result. [J Adv Prosthodont 2012;4:57-9]

**KEY WORDS:** Trismus; Burn scar; Implant; Removable partial denture; Milled bar; Implant and tooth supported

## INTRODUCTION

Most commonly, contractures arise where adequate burn care and delivery have not occurred and scar management has not been instigated in a vigorous manner. Repair by regeneration can no longer occur when the depth of injury extends beneath the reticular dermis, and healing by secondary intention.<sup>1</sup> The resultant wound contraction can lead to contractures over flexor surfaces and its surroundings. The incidences with contractions in oral region can limit proper prosthodontic treatments. For example, limitation of opening jaws may cause difficulties in accessing the dentitions and tissues of the oral cavity, and in using full size of removable denture for the patients. Telescopic implant-supported removable partial prosthesis with milled abutments has been used for the patient with burn contracture to provide enough retention and stability for the prosthesis.

## CASE REPORT

A 60-year old woman was referred from the plastic surgery department to the Department of Prosthodontics at Yonsei

University Health System. She had a chief complaint of restoring her oral function and esthetics after series of plastic skin graft procedure done. During the extra oral examination it was noted that the elasticity of muscle and skin tissue around oral angular area was lost due to scars from burns and tissue grafting, which resulted in limited maximum mouth opening of 20 mm. Therefore, proper prosthodontic treatment was impossible on the right quadrants of the mouth (Fig. 1). The intraoral examination showed that all of maxillary teeth were missing except tooth number #25 and splinted gold crowns on #34 and #35, whereas fixed partial denture on # 33 to #43 were present on the mandible.

In order to restore the patient's masticatory function, prosthodontic treatment plan of using 4 implants on the left quadrants was established. Each of two implants were placed on upper and lower posterior left jaws, however no implant on anterior ridge were possible due to severe atrophy of the maxilla. Anterior cantilever type removable partial denture was planned to meet patient's esthetic demand, which consists of a telescopic crown abutment on #25 and two implant supported abutments on area of # 26 and #27 in the maxillary area (Fig. 2). On the mandible, Implant-supported fixed partial denture

Corresponding author: Jae-Hoon Lee

Department of Prosthodontics, College of Dentistry, Yonsei University

134 Sinchon-dong, Seodaemun-gu, Seoul, 120-752, Korea

Tel: 82 2 2228 8711; e-mail, jaehoon115@yuhs.ac

Received July 28, 2011 / Last Revision August 18, 2011 / Accepted November 17, 2011

© 2012 The Korean Academy of Prosthodontics

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

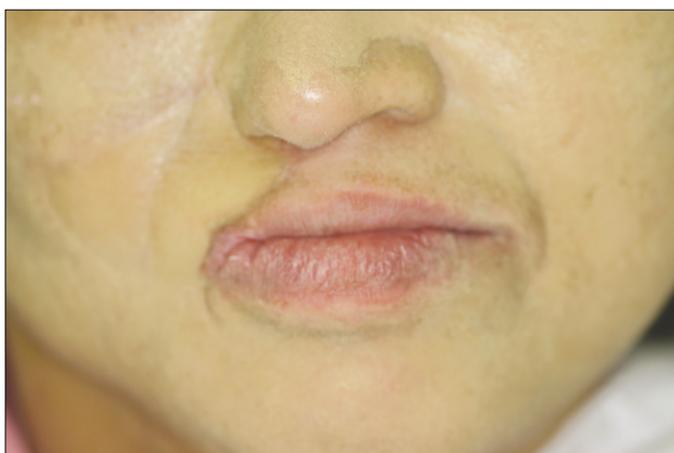
on area of #36 and #37 was planned.

The implants (Straumann® Basel, Switzerland) ( $\phi$  4.8 × 10 mm) were placed on predetermined area accompanied with sinus lift ridge augmentation procedure and proper follow up was performed during the 6 month healing period of time. Customized abutments were fabricated on implants and designed in the predetermined angle paralleling to the prepared tooth of #25 (Fig. 3). Removable partial denture was inserted to verify phonetics, esthetics and function. Key and keyway rigid attachment was used for retention and ledge type rest was used for support (Fig. 4). Panoramic view at initial placement of the prostheses was presented in Fig. 5. No complications have occurred in 5 years since the insertion of the prostheses (Fig. 6).

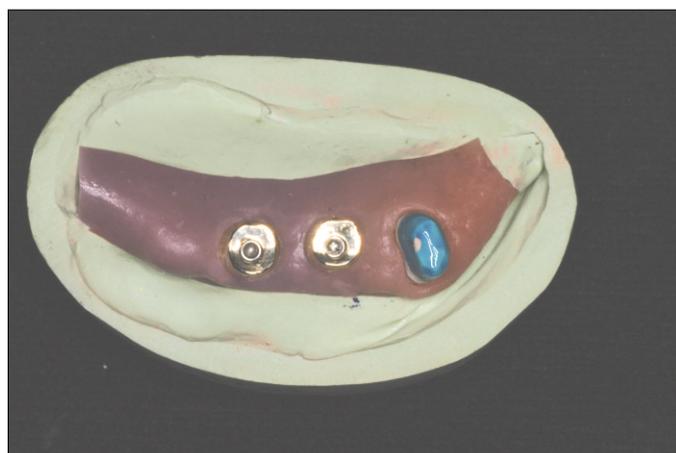
## DISCUSSION

Limited prosthodontic treatment is due to scar contracture on the tissues and trismus. Removable type of prosthesis was selected as treatment option after considering the factors of oral hygiene maintenance and lip support of patient to improve esthetics. Because there was only one natural tooth in the maxilla, we, therefore, had to improve the unfavorable removable partial denture using implants.<sup>2</sup> Due to the lack of anterior ridge, the implant option on anterior ridge was deemed unavailable, and natural tooth was splinted with implant to support anterior cantilevered prosthesis.

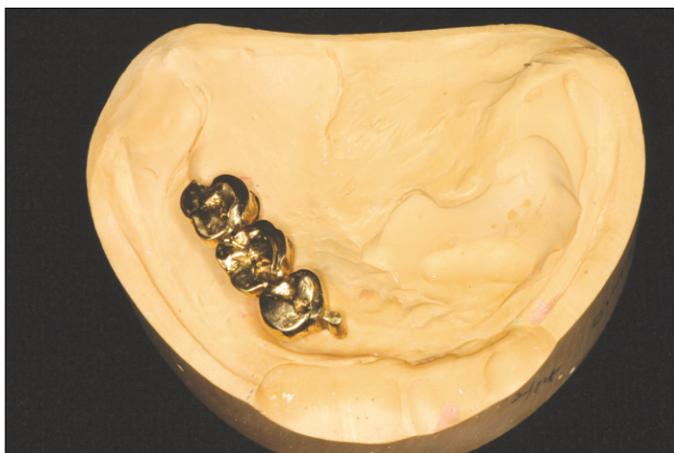
A remaining tooth was splinted to implant supported abutments. Combining implants with natural teeth is controversial



**Fig. 1.** Burn scars were prominent in the right side of this patient.



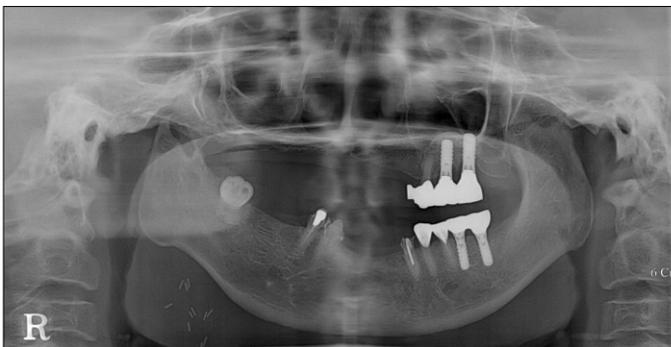
**Fig. 2.** Master cast for fixed prosthesis. One natural teeth and two implant abutment were prepared in the master cast.



**Fig. 3.** Master cast for removable prosthesis. Tooth and implant supported surveyed restoration was completed. The pick up final impression was conducted for removable prosthesis.



**Fig. 4.** Definitive prosthesis.



**Fig. 5.** Panoramic view at the placement of the prosthesis.



**Fig. 6.** Frontal view at 5 year follow up.

because of the variations in movement during function.<sup>3</sup> A lot of complications regarding implant and tooth-supported prosthesis may arise; including fracture of the prosthetic components, intrusion of the natural tooth, marginal bone loss, and loss of osseointegration,<sup>4</sup> but survival rates of implant and tooth-supported fixed prostheses are comparable to implant-supported fixed prostheses.<sup>5</sup> There was no prosthetic complication in implant-and tooth-supported fixed prosthesis in this case.

In this case, a removable partial denture with long anterior cantilever was used. Forces in the cantilevered area were transmitted to the abutments, causing tilting and rotational movements,<sup>6</sup> but cantilevered prostheses are preferable when reduced stress is inherent.<sup>6,7</sup> The prosthesis in this patient is expected to have a good prognosis since it is designed with hypococlusion in anterior areas.

## REFERENCES

1. Jackson DM. The evolution of burn treatment in the last 50 years. *Burns* 1991;17:329-34.
2. Mijiritsky E, Ormianer Z, Klinger A, Mardinger O. Use of dental implants to improve unfavorable removable partial denture design. *Compend Contin Educ Dent* 2005;26:744-6, 748, 750 passim.
3. Assif D, Marshak B, Schmidt A. Accuracy of implant impression techniques. *Int J Oral Maxillofac Implants* 1996;11:216-22.
4. Akpınar I, Demirel F, Parnas L, Sahin S. A comparison of stress and strain distribution characteristics of two different rigid implant designs for distal-extension fixed prostheses. *Quintessence Int* 1996;27:11-7.
5. Gunne J, Astrand P, Ahlén K, Borg K, Olsson M. Implants in partially edentulous patients. A longitudinal study of bridges supported by both implants and natural teeth. *Clin Oral Implants Res* 1992;3:49-56.
6. Himmel R, Pilo R, Assif D, Aviv I. The cantilever fixed partial denture-a literature review. *J Prosthet Dent* 1992;67:484-7.
7. Bevilacqua M, Tealdo T, Menini M, Pera F, Mossolov A, Drago C, Pera P. The influence of cantilever length and implant inclination on stress distribution in maxillary implant-supported fixed dentures. *J Prosthet Dent* 2011;105:5-13.