

Case Report

An innovative simplified method for assessing available bone in mandible for implant

S. Binsu, K. Chandrasekharan Nair¹, Sanjana Nayar², Suchita Tella³

Departments of Prosthodontics, Indira Gandhi Dental College, Ernakulam, Kerala, ¹A ECS Maruti College of Dental Sciences, ²Sree Balaji Dental College, Chennai, ³Kamineni Institute of Medical Sciences, Bengaluru, Karnataka, Tamil Nadu, India

Abstract The primary factor that determines the success of implant is the amount of available bone in the edentulous site. Diagnostic imaging and techniques help to develop and implement a cohesive and comprehensive treatment plan according to the available bone. In the following case report an innovative simplified method (poor man CT) is used to fabricate a three dimensional model to assess the available bone for implant placement in mandible.

Key Words: Extraoral impression, intraoral impression, three-dimensional model

Address for correspondence:

Dr. Binsu S, Prima, Kaladi, Ernakulam - 683 574, Kerala, E-mail: drbinsu@gmail.com

Received: 24th March 2015, **Accepted:** 16th August, 2015

INTRODUCTION

Many imaging options have been recommended for implant treatment planning. However, neither buccolingual width nor angulation can be properly visualized on the most traditional radiographs.^[1] In the following case report, an innovative simplified method without radiation is used to fabricate a three-dimensional model to assess the available bone for implant placement in the mandible. Even a minor variation in comparison to ideal placement causes difficulties in fabrication of final prostheses.^[2,3] Three-dimensional model achieved can be used to fabricate surgical guide. The surgical guide is essential to establish a logical continuity among diagnosis, prosthetic planning, and surgical phase.

CASE REPORT

A patient of age 27 years reported to the Department of Prosthodontics for the replacement of missing left first molar. Following steps were performed to achieve a three-dimensional model:

1. Intraoral impression was recorded with addition silicone putty and light body [Figure 1]
2. Fabrication of acrylic assembly for aligning both intraoral and extraoral impression

A rectangular block of acrylic was made to which impression tray was pressed to make indentations. After applying separating medium, the counter block

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Binsu S, Nair KC, Nayar S, Tella S. An innovative simplified method for assessing available bone in mandible for implant. J Indian Prosthodont Soc 2016;16:213-5.

Access this article online	
Quick Response Code:	Website: www.j-ips.org
	DOI: 10.4103/0972-4052.167946

of acrylic was made to which extraoral impression was attached [Figure 2]. In prototype, [Figures 2-4] plastic rod was used for supporting the extraoral impression

3. Replacing the plastic rod with metal plate and key system
The plastic rod was replaced by a metal plate in the first generation [Figure 5] for better stability and better

customization. A key system was incorporated to adjust the length and angulation according to each patient's mandible. On the top of the metal plate, acrylic was adapted. Addition silicone putty placed on the acrylic plate can be customized each time to record the extraoral impression. The extraoral impression should record the

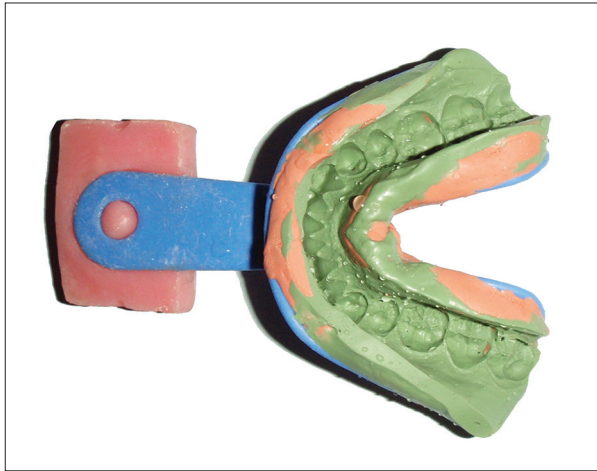


Figure 1: Intraoral impression with acrylic assembly

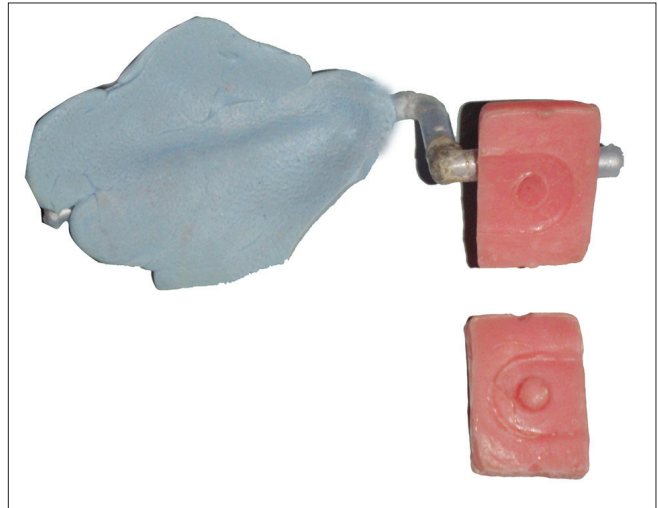


Figure 2: Prototype (extraoral impression)



Figure 3: Prototype - Extraoral and intraoral impression together with acrylic assembly

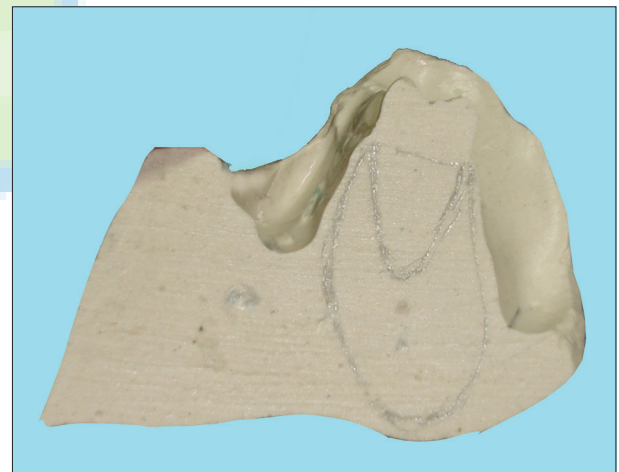


Figure 4: Prototype model



Figure 5: First generation metal plate

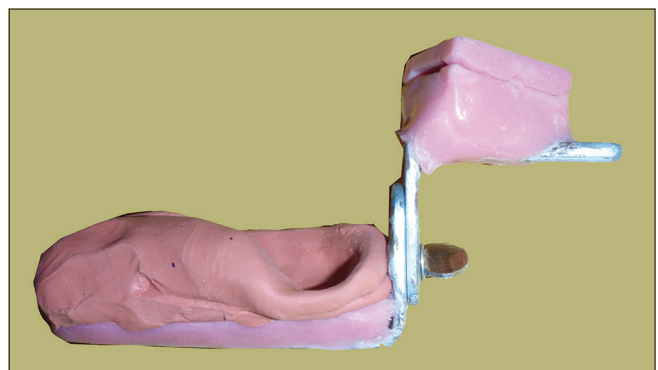


Figure 6: Assembled metal frame



Figure 7: Three-dimensional model



Figure 8: Three-dimensional model with surgical guide

lower border of the mandible to the medial extent as much as possible [Figure 6]

4. Fabrication of three-dimensional model

The intraoral impression was poured first to get a cast. After the initial setting was over, the entire assembly was

poured, and a three dimensional model of the mandible was fabricated [Figure 7].

The accuracy of this method was verified with computed tomography (CT) scan. The cross section where the mandibular premolar teeth were disappearing from the CT image was taken (14 mm depth) as a reference and measured to get the available bone width buccolingually (8.7 mm). This measurement was same when compared with the available bone in the sectioned cast at the premolar area, at a depth of 14 mm (premolar root length).

On the three-dimensional model, the surgical guide was fabricated [Figure 8]. This surgical template can dictate the implant body placement that offers the best combination of support for the repetitive forces of occlusion and esthetics.

This article had won the best table clinic award in 35th IPS conference conducted in New Delhi 2007 by Army Dental Corps.

Acknowledgment

Aman Arora.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Garg AK, Vicari A. Radiographic modalities for diagnosis and treatment planning in implant dentistry. *Implant Soc* 1995;5:7-11.
2. Widmann G, Bale RJ. Accuracy in computer-aided implant surgery—A review. *Int J Oral Maxillofac Implants* 2006;21:305-13.
3. Takeshita F, Suetsugu T. Accurate presurgical determination for implant placement by using computerized tomography scan. *J Prosthet Dent* 1996;76:590-1.