

# The Magic of Resurrection by Bone Expansion : A Case Report

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## Abstract

**B**one spreading technique (BST) is a horizontal augmentation with minimal trauma for simultaneous implant placement. The foremost advantage of the bone spreading technique is a substantially less invasive method. In this technique the buccal wall expands after the medular bone is compressed against the cortical bone. The lateral dilation and compaction of medular bone improves primary stability. Bone Spreading Technique used in this case report avoided discomfort of the patient for having an extra surgery as compared to an augmentation procedure.

**Key Words :** Ridge expansion, deficient alveolar bone width, bone spreading, dental implant

## Introduction

The use of endosseous implants for successful restoration of patients with partial or total tooth loss has been well-established.<sup>1-3</sup> Placement of endosseous implants requires sufficient height and width of alveolar bone. Bone resorption is an inevitable consequence of tooth loss. In number of cases, vertical resorption can progress to reach the basal bone and horizontally, the resorption may progress to the extent that, it may render an implant placement difficult.<sup>4</sup>

When there is loss of alveolar bone volume and associated mucosa, the function and esthetics of restoration can be poor. However, the ability to regenerate maxillary and mandibular bone and soft tissue using suitable augmentation methods and materials has extended the range of implant treatment.<sup>5</sup>

One of the criteria considered during the implant placement is the presence of at least 1 mm of bone around the implant. The implant sizes may vary from 3 mm to 6mm in diameter and 5mm to 18 mm in height.

Many different techniques have been used in an attempt to modify the amount and direction of bone growth.<sup>6</sup> Bone grafting with the application of synthetic materials or combinations of two or more graft types are frequently used.<sup>7,8</sup> Autogenous graft should be preferred, however, the primary disadvantage is the need for an additional surgery in the donor site.

This clinical report describes the application of bone spreaders assisted bone expansion of resorbed maxillary anterior ridge in a patient with missing right maxillary central incisor with immediate implant placement.

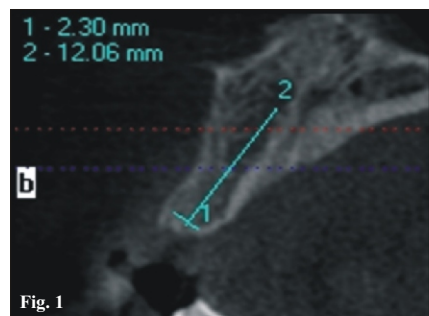
## Case Report

A patient aged 21 years reported to the department of Prosthodontics at Dr. D.Y. Patil Dental College and hospital, Navi Mumbai

with a chief complaint of missing maxillary right central incisor. The patient was concerned about her appearance and wanted to get the tooth replaced. Her medical history did not reveal any significant clinical condition.

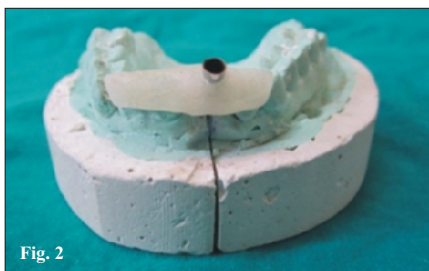
The dental history revealed that she lost her right maxillary central incisor six months back due to a fall. Various treatment options were discussed with the patient. However, the patient was keen on fixed-prosthesis for replacing her missing maxillary right central incisor without preparing of the adjacent teeth.

Intraoral examination revealed a thin alveolar ridge (labiopalatally) in the maxillary right central incisor region covered by healthy mucosa. Cone Beam Computed tomography (CBCT) scan was done to evaluate the bone quality and quantity. It revealed that the labiopalatal thickness of the bone in the edentulous region of about 2.3 mm (Fig.1)



## Procedure

Diagnostic impressions were made in alginate (Tropicalgin, Zhermack, USA). Diagnostic models were made in dental stone (Kalstone type III gypsum material Kalabhai Karson, Mumbai, India) on which diagnostic wax up was done. A putty index using addition silicone impression material was made on the wax up model. The putty index was made to verify the angulations of the implant in the oral cavity. The cast was split for doing the bone mapping and to determine the angulations of the implant by putting a sleeve in the surgical stent. (Fig. 2) Prophylactic antibiotics (Mox



500 mg) were prescribed to the patient. The surgical stent was checked in the mouth (Fig. 3). Local anaesthesia (Xicaine 2% lignocaine



HCL 1:80,000 adrenaline, ICPA, India) was administered. One horizontal and two vertical releasing incisions were made to allow maximum access and visualization of the underlying bone (Fig. 4). The mucoperiosteal



flap was elevated. The implant stent was then placed in the mouth and through the sleeve using the pilot drill of 2mm the osteotomy was made (Fig. 5). Paralleling pin was placed



in the osteotomy to check the angulations with a previously made putty stent on the wax up model (Fig. 6, 7). Once the angulations were verified osstem bone spreaders were used to expand the ridge. Bone spreaders of width 2.2mm and 2.8mm were used to expand the osteotomy (Fig.8, 9). After this the implant of 3.5 mm was placed (Fig. 10). Again the angulations were checked by using the putty index (Fig.11, 12, 13). Sutures were





Fig. 6

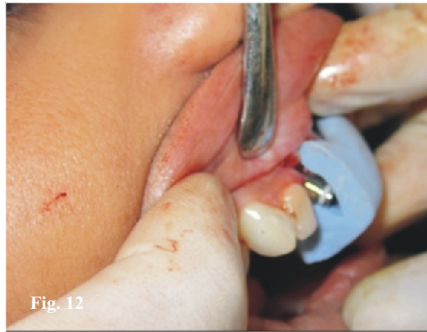


Fig. 12



Fig. 7



Fig. 13



Fig. 8

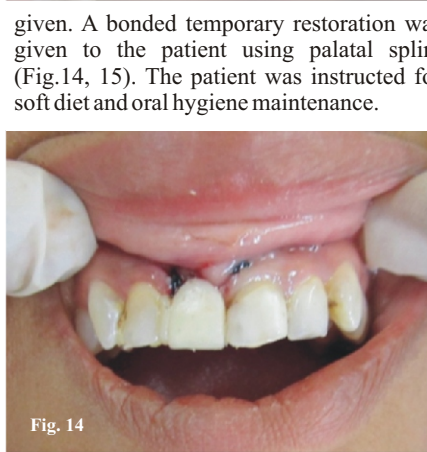


Fig. 14



Fig. 9



Fig. 15



Fig. 10



Fig. 11

given. A bonded temporary restoration was given to the patient using palatal splint (Fig.14, 15). The patient was instructed for soft diet and oral hygiene maintenance.

**Discussion**

The ultimate objective of implant treatment is to provide replacement of missing teeth. As with any treatment, pre-surgical planning is crucial for success. In response to changing treatment concepts, different surgical approaches in implant placement have been developed, including implant placement following cortical plate expansion in maxilla. The correction of horizontal alveolar ridge defects to place dental implants can be achieved through several techniques such as autogenous

grafting, horizontal guided bone regeneration and bone spreading technique.<sup>9</sup> It helps in maintaining the height and width. It has a higher potential for implant support by simultaneous implant placement and is a better and economical alternative of conventional method of bone tapping.

Bone Spreading Technique is horizontal augmentation procedure. It is an effort to shorten the length of treatment, avoid an additional surgical appointment. Bone Spreading Technique would both lessen the trauma to patient and conserve the maximum amount of alveolar bone at precise site of anticipated implant placement would offer clinical benefits. It reduces the post healing period. Osstem bone spreaders kit was used. The kit contains four spreaders. The spreaders are based on a palm held design. They come in an increasing diameter of 2.2mm to 3.5mm. Spreader of increasing diameters are gently placed sequentially to expand the implant site. With each insertion of a larger diameter spreader the bone is pushed laterally. The implant should be slightly larger in diameter than the site created by the largest diameter spreader.

**Conclusion**

Bone Spreading Technique for horizontal ridge augmentation with implant placement has been shown to be predictable and successful in treating the maxilla with deficient alveolar bone width. Bone Spreading technique is superior to drilling technique for application in soft maxillary bone. Implant placement was carried out along with bone spreading which helped resolve the defect by formation of bone. This had a great advantage of overcoming the problem of the defect, hence maintaining the stability of the implant.

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