



# Treatment alternatives for full edentulism conventional versus implants-imagistic assessments



Marina Melescanu Imre, Ana Maria Tancu, Mihaela Marin, Cristina Preoteasa, Madalina Vuza, Elena Preoteasa  
Faculty of Dentistry UMF Carol Davila, Bucharest, Romania

## Abstract

The goal is to highlight some morphological aspects due to severe bone resorption, assessed through imagistic methods in order to choose the most appropriate treatment alternative.

A pilot study was conducted on full edentulous or in imminence to become edentulous patients. The assessment of bone level required was done through clinical and imagistic measurements: panoramics and CBCT to determinate the height of the residual alveolar bone and to establish the most appropriate therapeutical alternative.

The predictability and success of implant therapy in edentulous patients is correlated with bone resorption.

## Introduction

In terms of prosthetic, the bone is considered as being a support structure of the full conventional prosthesis. In elderly people osteoclast proliferation being low, physiology phenomena of bone resorption occur.

This continuous ridge resorption, about 4-5 mm in the first year after extractions and 0.5 mm per year in the coming years (1) is exacerbated by non-physiological pressures of masticatory forces transmitted over the muco-bone support by conventional prostheses. These patients often exhibit functional problems due to lack of good retention and dentures stability.

The loss of teeth and use of a removable prosthesis can result in continued alveolar bone atrophy in both the vertical and horizontal dimensions.

With the appearance of dental implants, treatment for full edentulism gained new values - respectively fixed or mobile prosthetics alternative on implants. rosthesis on implants of the full edentulous, along the functional benefits brought to the patient, contributes to reducing the bone resorption rate.

Success of dental implants depends on the jawbone quantity and quality. Therefore, it is important to measure the alveolar process precisely so that the proper system may be chosen (2).



Figure 1. CBCT of maxillary severe atrophy planned for removable denture on implants

## Methods and Materials

This pilot study was conducted on female patients, full edentulous or in imminence to become, ages from 52 to 65 years old.

When the goal is to use a fixed reconstruction to restore an edentulous span to as natural a state as possible, both the clinician and patient must be aware that missing bone may limit the functional and esthetic results.

Knowing the amount of bone required can also reveal the relative predictability of the grafting procedure, as well as whether a removable or fixed prosthesis will yield the best results.

Radiological measurements-panoramic radiography and CBCT were required in order to determinate the height of the residual alveolar bone in maxillary and mandible to establish the most appropriate therapeutical solution.

For the upper jaw, 2 measurements were made. First the vertical bone (coronal- apical) loss and second the horizontal one (buccal-palatal). The measurements were made on the planned implants sites prosthetically driven. The horizontal bone quantity was assessed on CBCT images.

For the lower jaws the same measurements were made, both horizontal and vertical, also on CBCT and panoramics radiographies in order to evaluate the most appropriate treatment option-removable over denture on conventional implants or mini implants, or fixed prosthetics on implants.

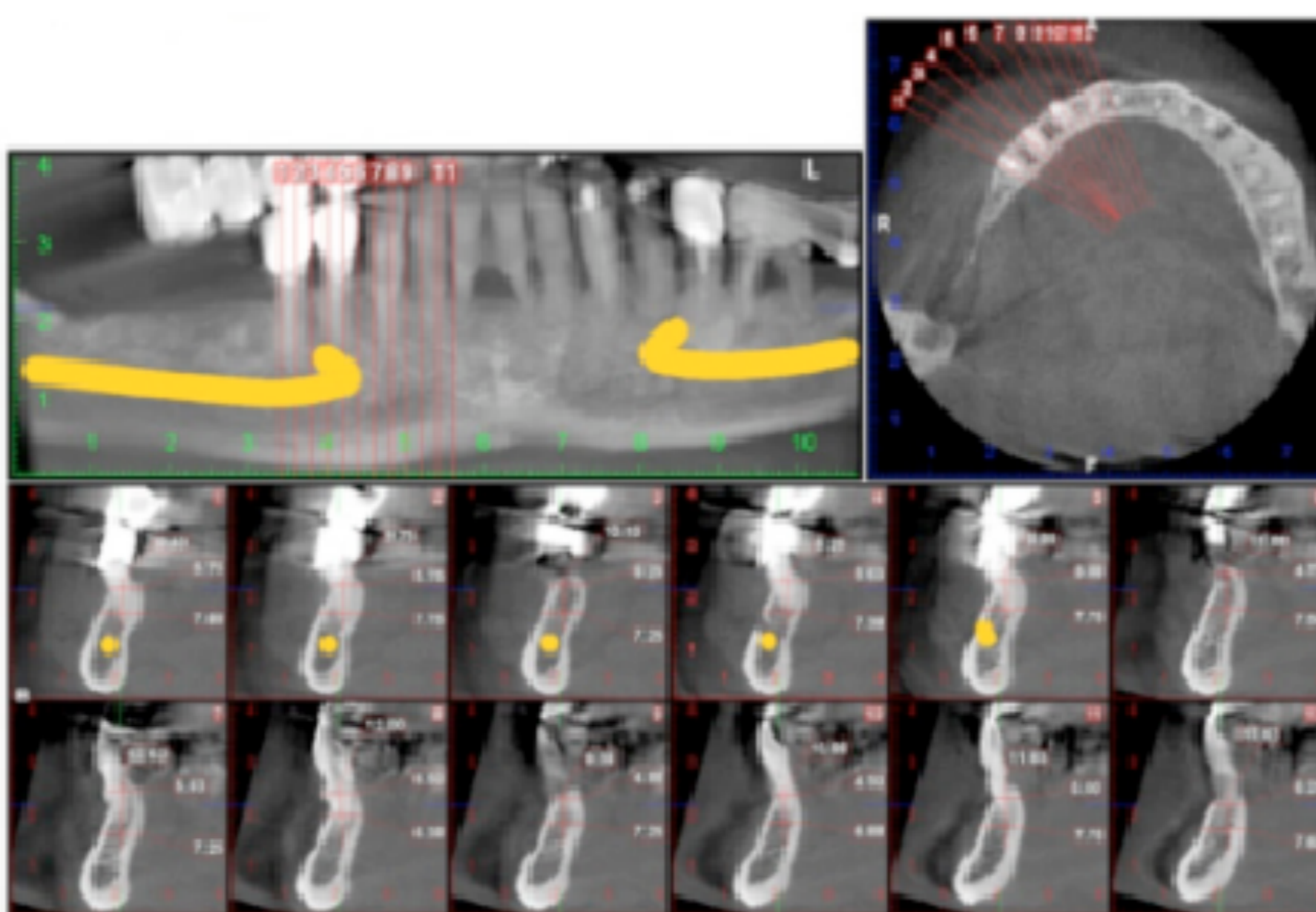


Figure 2. CT image of a mandible in imminence to become full edentulous planned for fixed implants restoration.

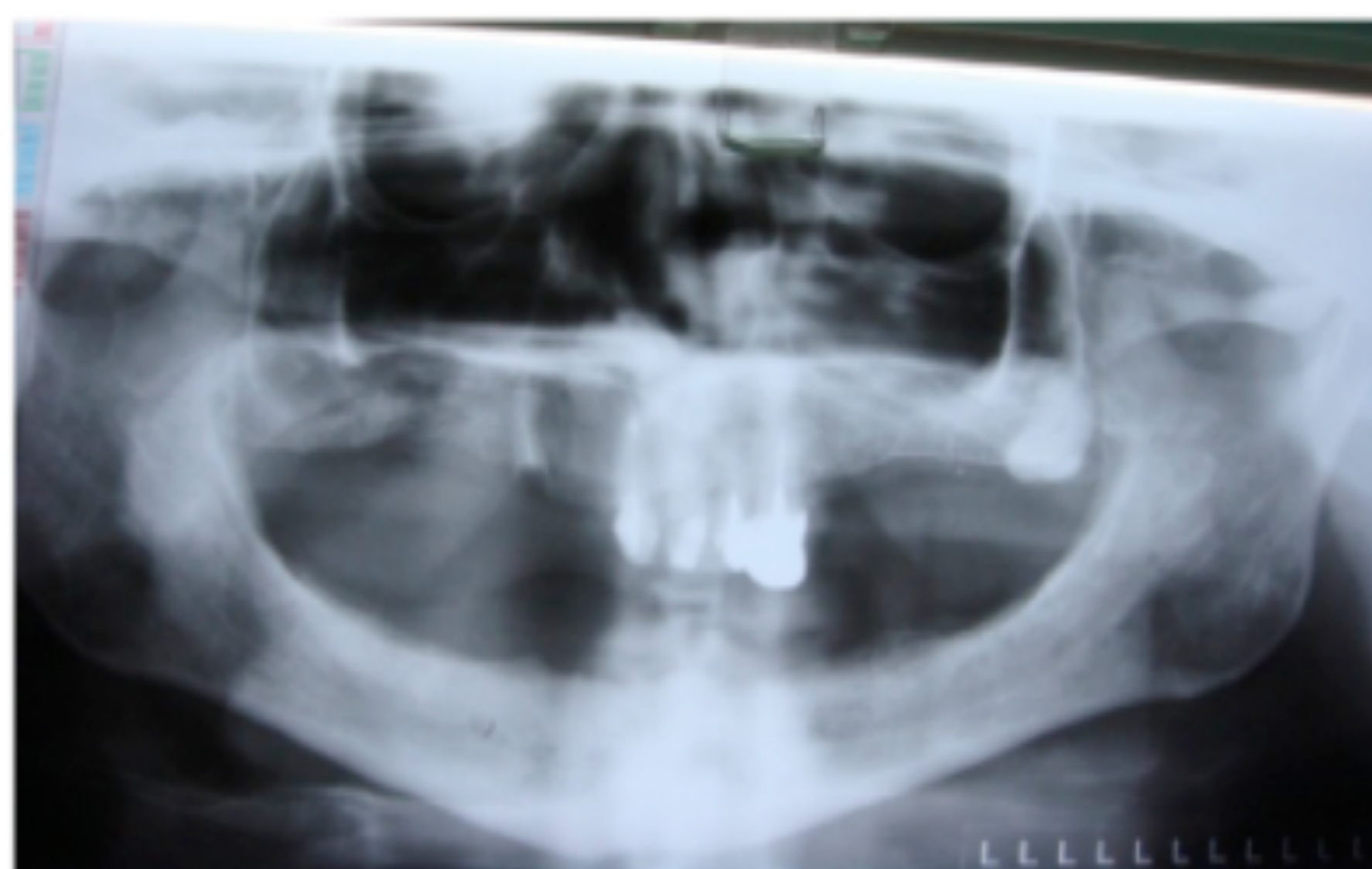


Figure 3. Panoramic radiography of atrophic mandible planned for narrow diameter implants placement.

## Results

For the upper jaw, bone level, vertical and horizontal dimensions are a factor to be considered. A simplification of bone presence in the edentulous maxilla includes 3 categories:

- 1) no resorption
- 2) limited bone resorption
- 3) severe bone resorption.

Cases of severe vertical bone resorption typically require extensive surgical procedures to restore the lost tissue. Even so, such procedures are not always successful. Usually a removable prosthesis is the superior alternative when severe bone loss has occurred to treat a severely resorbed maxilla (fig. 1).

Horizontal bone resorption is also of major importance in determining the optimal prosthetic reconstruction. When the buccal-palatal plate has also been resorbed, one option is to graft the missing buccal.

For the edentulous mandible where the atrophy is usually more severe (Atwood, Cawood) (fig. 2), Misch and Chee (4) recommended as therapy options the following solutions: fixed prosthetics on implants, removable prosthetics on implants or overdenture (table 1).

Mandibular residual ridge	Therapy options
Non atrophic	Fixed prosthetics on implants
Moderate resorption	Removable on 4-6 implants
Severe atrophy, less than 12mm height	Overdenture on 2 narrow diameter implants (fig 3)

Table 1. Therapy options for the mandible

## Discussions

A study published and conducted at the Department of Periodontology and Implant Dentistry of NYU showed that from 34 cases the repartition was only 9% with fixed prosthesis, 56% removable hybrid on 4-6 implants, 23% overdenture, 9% with NDI overdentures and 3% only with conventional denture.

So the results obtained through measurements and planning were correlated to actual literature data and matched perfectly.

## Conclusions

The predictability and success of implant therapy in edentulous jaws is strictly correlated with bone anatomy elements.

The treatment plan has to consider and evaluate the bone anatomy, the resorption in order to recommend the best therapeutical attitude: fixed, removable prosthesis, or sometimes due to high resorption rate, especially on mandible, the conventional denture remains the only solution for edentulous patients.

## Contact

Author: Marina Meleşcanu-Imre  
e-mail: melim.marina@gmail.com

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