

# Prosthodontic Space Management in Anterior Tooth Region Esthetically – A Case Study

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## Abstract

Importance of smile has made aesthetics as a significant factor in replacing missing tooth in the anterior region. Prosthetic replacement mainly aims to preserve and restore health along with aesthetics and function. Reduced intra-arch space in pontic region always precludes the replacement of missing tooth both aesthetically and functionally with removable partial denture/ fixed partial denture / implant treatment. A simple non-traumatic option is, to gain space and to restore the tooth with fixed partial denture aesthetically. The pontic space is gained by using minimum available space between the abutment tooth and adjacent tooth and modifying the shape and size of the abutment tooth without compromising the aesthetics, function and beauty of patient.

## INTRODUCTION

Prosthetic dentistry strives to emulate harmonious form, function therapy and appearance by integrating ideal interdisciplinary treatment. The prosthetic treatment option can be selected appropriately based on the malocclusion, the anterior relationship, specific space requirements and the condition of the adjacent tooth. Most of the patient prefer fixed partial prosthetic treatment option because of less duration and better comfortable.

Factors need to be considered for the abutment tooth for fixed prosthesis are adequate abutment support, 2:1 crown length ratio, absence of caries, healthy periodontal support, sufficient intra-arch and inter-arch space, no drifting or supra eruption of opposing tooth. Among the above factors, it is very difficult to restore the missing tooth with reduced intra-arch space by conventional removable partial denture/ fixed partial denture/ by implant aesthetically. Restoring with removable partial denture may result in denture with poor aesthetics. Implant placement is also precluded because of minimal bone height and width available in the edentulous space. By replacement with conventional fixed partial denture the size of the replaced tooth looks much smaller and unaesthetic.<sup>2</sup> so a challenging task is performed to replace the tooth with fixed partial denture.

This article describes the treatment for the patient with reduced intra arch anterior edentulous space with conventional fixed partial denture design.

## CASE STUDY

A 21 year old female Mrs. Vasumathi reported to our saveetha dental college and hospital in chennai, with the complaint of missing tooth in the upper front tooth region for past 10 years. She desires to replace the tooth with fixed prosthesis. Her past dental history reveals that she underwent extraction treatment in the upper front tooth due to trauma before 10 years.

A clinical examination reveals missing right central incisor (11) with mesially migrated right lateral incisor (12) and left central incisor (21). Mild crowding in lower anterior & generalized chronic gingivitis is present. She has got straight profile and angles class-I molar relation. Soft tissue examination reveals no lesions in buccal mucosa, alveolar mucosa and tongue. Radiographic examination

reveals normal radiographic anatomy of periodontal ligament space and adequate alveolar bone support in 12 & 21.

## EXTRA ORAL VIEW



## INTRA-ORAL VIEW



## DIAGNOSIS AND TREATMENT PLANNING

Diagnosis of this patient is concluded as partially edentulous upper arch with reduced intra-arch space. Reason that hinders in the treatment plan is the insufficient space for the replacement of missing tooth.

The first step in the treatment plan is the gaining space for replacement of missing tooth. The best method to gain space could be proximal stripping with orthodontic tooth movement, following fixed partial denture prosthesis. Patient was explained about the treatment method. Patient

was not willing for the proximal stripping & orthodontic tooth movement. Most patients are reluctant to time and funds necessary for this extended and extensive orthodontic treatment.<sup>1</sup> Hence treatment with metal ceramic fixed partial denture was planned to gain space by altering the size and shape of the abutment tooth slightly and by using minimum available spaces adjacent to the abutment tooth without compromising the aesthetics.

**PROCEDURES**

Two sets of alginate impression were made in both upper and lower jaw. One set of model cast was used for the evaluation of pontic space and abutment tooth. The width of the space available for pontic is 5.5mm. The width of the abutment tooth, lateral incisor (12) is 6.5mm and central incisor (21) is 8.5mm. The other set of the model cast was used for mock tooth preparation in relation to 12 and 21. Mock preparation has been done in such a way that both the tooth is over prepared for making wax pattern.

Diagnostic wax pattern is made on the prepared cast to evaluate the aesthetics and outcome of the final prosthesis. It has been made pretending fixed partial denture such that

- the size and shape of left and right central incisor (11 and 21) was made similar.
- the left lateral incisor (12) was made to its ideal shape.

**WAX PATTERN ON THE CAST**



Putty index was made. Planning was made to do tooth preparation in the patient's mouth with putty index as a guide. Abutment tooth preparation has been done in 12 and 21 for metal ceramic fixed partial denture. An abutment tooth was prepared in a standardized manner as follows - Incisal reduction of 2 mm, Axial reduction of 1.5 -2mm, rounded shoulder finish line located 0.5mm subgingivally on the facial aspect for aesthetic reasons and supragingivally in the lingual surface on the sound tooth structure with rounded internal line angle. A slight increase in the occlusal convergence has been done in 12 to gain space for pontic.

**LABIAL AND LINGUAL REDUCTION**



**INCISAL AND PROXIMAL REDUCTION**



**TEMPORARY RESTORATION**



The final impression was made with vinyl poly siloxane material and was sent to laboratory for framework of final prosthesis. Provisional restoration has been made and luted with zinc oxide eugenol cement. Provisional restoration should be made to pretend the final restoration. The patient's provisional restoration was removed. Final prosthesis retrieved from laboratory has been inserted inside the patient mouth to check for marginal adaptation and intercuspation. Necessary adjustments are made on the final prosthesis. Luting of final prosthesis was done with type I glass ionomer cement.

**FINAL RESTORATION**



### CONCLUSION

The importance of interdisciplinary treatment planning to achieve optimal aesthetics and long term predictability should be analysed and evaluated. Replacing tooth with inadequate intra-arch space is a challenging treatment for the operator. The fixed partial denture by using space from the prepared tooth and space available distal to the abutment tooth has been used to restore the patient's occlusion. Compromisation of 2mm has been done. This method of fixed partial denture is highly convenient, non-invasive and has better predictability. The patient's aesthetic and functional requirement were satisfied. But this kind of restoration doesn't suit for all cases.

A good diagnosis with complete analysis, evaluation should be done. Diagnostic wax pattern should be done to evaluate the outcome of final prosthesis.

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