

Treatment Of Generalized Spacing: A Combined Orthodontic Conservative Approach: A Case Report

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Abstract:

Spaced dentition is characterized by interdental spaces and lack of contact points between the teeth. Careful diagnosis and treatment planning on a multidisciplinary basis is required to treat adult patients with generalized spacing outcome.

The following case report presents treatment of an adult female patient having generalized spacing in upper and lower arches and peg shaped upper right lateral incisor using fixed mechanotherapy with MBT bracket system followed by reshaping of peg shaped lateral incisor by direct composite build up.

Key Word: spaced dentition, midline diastema, fixed orthodontic treatment, peg shaped lateral incisor, composite buildup

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I. Introduction

Spaced dentition is characterized by interdental spaces and lack of contact points between the teeth. Spacing is classified as localized or generalized based on number of teeth included. It is one of the most common aesthetic problems for many patients¹. The aetiology of generalized spacing may be hereditary, acquired, or functional. Hereditary causes include tooth size-arch length discrepancies, microdontia, congenitally missing teeth, impacted supernumerary teeth, small teeth, and hypertrophic frenum. Functional causes include oral habits, tongue thrust. The pathologic conditions increasing tongue size, missing teeth, delayed eruption of permanent teeth, and periodontal disease are classified as acquired problems²

Orthodontics plays an important role in the management of spaced dentition, often in cooperation with other dental departments such as oral surgery, periodontology, aesthetic dentistry, and prosthodontics. To achieve the most aesthetic and functional result, orthodontists must carefully evaluate the etiologic factors of diastemas in their patients.

Three treatment options are available for generalized spacing: aesthetic intervention using composite resin, orthodontic space closure, or closure of anterior spaces and opening posterior spaces, which will be rehabilitated later with prosthetic restoration¹. After orthodontic treatment, it is frequently necessary to apply fixed retention as these cases have a high risk of relapse. ^{1,2}

II. Case Report

A 21-year-old female patient came to Department of Orthodontics and Dentofacial Orthopedics, Dr. R. Ahmed Dental College & Hospital complaining of spacing between upper front teeth. On Extraoral examination she was found to have mesoprosopic facial form with straight profile with potentially incompetent lips having 4 mm of inter-labial distance. On intraoral examination she had spacing of anterior maxillary and mandibular dentition. Her molar and canine were in class I relationship. Upper right lateral incisor was peg shaped with reduced mesial-distal dimension. Both maxillary and mandibular incisors were procumbent with overjet of 1.5mm and overbite of 1mm. Patient did not have any tongue thrust habit and her frenal attachment was normal. Her cephalometric values show her to be the case of skeletal class I jaw base with ANB angle of 3° and wits appraisal of 1.5mm. Model analysis shows that there was 3.5 mm space excess in maxillary arch and 3mm space excess in mandibular arch by using arch perimeter analysis. No other defects were found in temporomandibular joint and surrounding structures. (Fig-1)



FIG 1

Diagnosis

A 21-year-old female non growing patient with Angle's class I molar relation on class I skeletal base with generalized spacing in both maxillary and mandibular arch associated with peg shaped maxillary right lateral incisors.

Treatment objectives

The treatment objectives were to level and align the arches, close the space in both arches, contouring of peg shaped lateral incisor to proper shape and dimension, obtain positive overjet and overbite, and settle the arches in well-inter cusped occlusion. To achieve these treatment objectives, comprehensive orthodontic treatment was proposed. Fixed retention was planned

Treatment Progress:

Patient was treated with fixed mechanotherapy using Pre-Adjusted Edgewise MBT 0.022 Slot Brackets, and alignment with 0.014 inch NiTi archwires followed by .016 inch, .019x.025 inch NiTi and .019x.025 inch stainless steel archwires. Consolidation and closure of existing spaces was done with the help of Elastomeric chains delivering light continuous forces and replaced after every 8 weeks due to force decay and reduction in its activity³. Peg shaped upper right lateral incisor was reshaped by direct composite build up⁴. fixed retainer was given after the completion of treatment.⁶

Treatment results

Post-treatment evaluation showed that patient's complaints had been addressed. Teeth were esthetically pleasing while smiling. Lip competence was improved and soft tissue profile changed favorably due to the correction of lip position. Upper and lower arches were well aligned with consonant smile arc. All spaces were closed successfully. Posterior occlusion had good overall intercuspation and was well settled in a Class I

relationship. Normal overjet and overbite were achieved. Upper and lower dental midlines were compatible with facial midline (Fig-2)



FIG 2

III. Discussion

For centuries facial aesthetics has been a subject of interest to people of all cultures .The world is full of evidence of what human beings have done since antiquity to make themselves more beautiful and attractive. As far as orthodontics is concerned , harmonious facial aesthetics and functional occlusion have long been recognized as the two most important goals of orthodontic treatment. Fixed appliance treatment can significantly alter and improve facial appearance in addition to correcting irregularity of the teeth. The selection of orthodontic fixed appliances is dependent upon several factors which can be categorized into patient factors, such as age and compliance, and clinical factors, such as preference/familiarity and laboratory facilities and most importantly the cause of malocclusion. The patient's chief complaint was spaced upper front teeth and sought treatment for the same. After analyzing the case thoroughly and reading all pretreatment cephalometric parameters along with evaluating the patients profile clinically, a decision was made of proceeding with the treatment without extracting the 1st premolars as the patient presented with spacing and the existing spaces would be enough to correct the spaced anterior teeth. Retraction and closure of existing spaces was done with the help of Elastomeric chains delivering light continuous forces and replaced after every 4 weeks due to force decay and reduction in its activity. All spaces were closed successfully. Peg lateral was corrected with direct composite build up⁵. Posterior occlusion had good overall intercuspation and was well settled in a Class I relationship.⁵

Parameter	Pre treatment	Post treatment
SNA	74	73°
SNB	71°	71°
ANB	3°	2°
Wit's Appraisal	1.5 mm	1.5mm
Upper CI to NA (linear/angular)	08mm/39°	4mm/26°

Lower CI to NB (linear/angular)	11 mm/42°	6mm/30]
IMPA (Tweed)	99°	93°
F M A	30°	30°
Y (growth) axis	57°	57°
Jarabak's ratio	62.48%	60.86%
ANS-Me	57mm	57mm
Nasolabial angle	90°	95°
Ricket's E line U/L	-2mm/0mm	-4mm/-2mm

TABLE 1

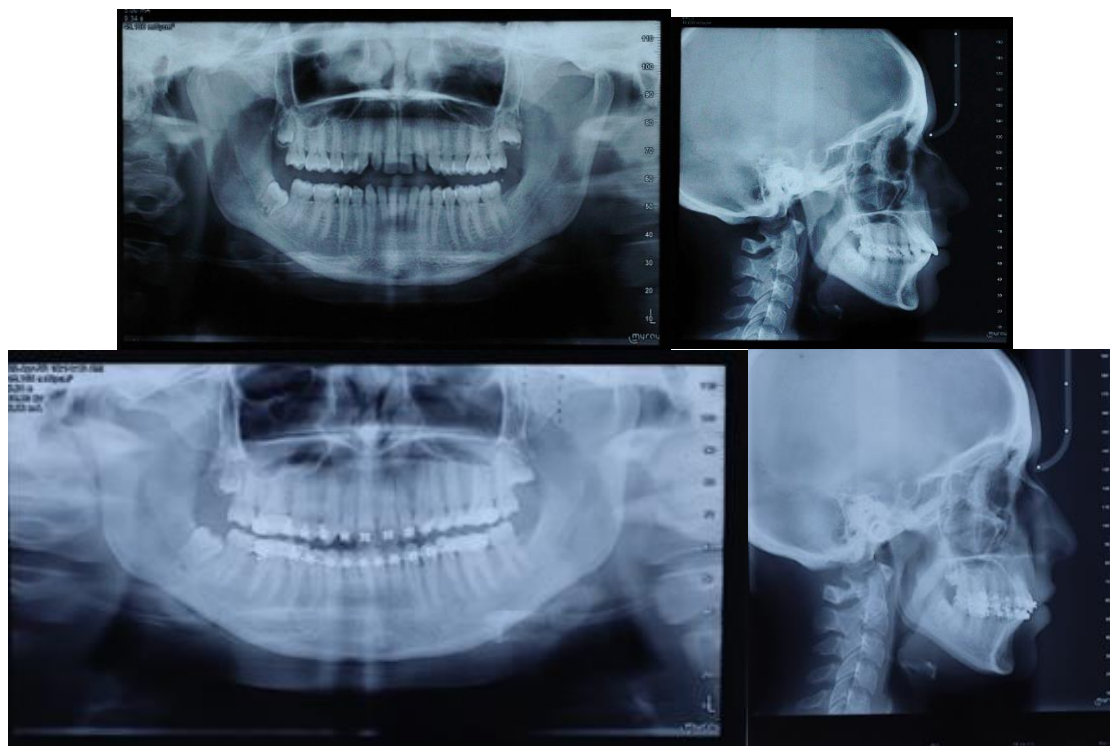


FIG 3,4

IV. Conclusion

This case report illustrates the interdisciplinary collaboration of an Orthodontist and endodontist for treatment of such a case. With proper case selection, planning and good patient cooperation, we could obtain significant results. This case report shows how Class I spacing case can be managed by means of appropriate use of simplified fixed orthodontic treatment and efficient conservation of anchorage at the same time. The planned goals set in the pre-treatment plan were successfully attained. Good intercuspation of the teeth was achieved with a Class I molar, incisor and canine relationship. The maxillary and mandibular teeth were found to be aesthetically satisfactory in the line of occlusion. Patient had an improved smile and profile. The correction of the malocclusion was achieved, with a significant improvement in the patient aesthetics and self-esteem.