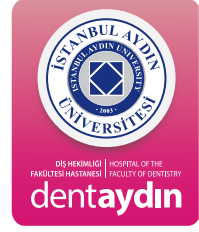




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## TREATMENT OF SKELETAL CLASS II DIVISION I MALOCCLUSION WITH RAPID MAXILLER EXPANSION AND ACTIVATOR APPLIANCES: A CASE REPORT

**DergiPark**  
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### ABSTRACT

The aim of this case report presents a case of skeletal II and dental Class II divisional I treated with functional appliance in a male patient with increased overjet. A 9-year-11-month-old male patient was admitted to our clinic with lower jaw retention. Clinical and radiographic evaluation revealed skeletal class II and dental class II division I anomaly and increased overjet due to mandibular retrognathia. The treatment was started with rapid maxillary expansion. After the retention period of 6 months, the treatment was continued with activator

appliance to correct mandibular retrognathia. Mandibular advancement and class I molar and canine relationship were achieved after 10 months of activator use. In conclusion, in the case of dental class II division I, increased overjet, rapid maxillary expansion and functional treatment with activator appliance resulted in a good occlusion with normal overbite and overjet with dental class I relationships.

**Keywords:** *Class II division I, increased overjet, functional treatment*

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## İSKELETSEL SINIF II BÖLÜM I MALOKLUZYONUN HIZLI ÜST ÇENE GENİŞLETMESİ VE AKTİVATÖR İLE TEDAVİSİ-VAKA RAPORU

### ÖZ

Bu vaka raporunun amacı; iskeletsel II ve dişsel Sınıf II divizyon I artmış overjeti olan erkek hastanın fonksiyonel apareyler ile tedavisi yapılan olguyu sunmaktır. Kliniğimize 9 yıl 11 aylık erkek hasta alt çene geriliği şikayetiyle başvurdu. Yapılan klinik ve radyografik değerlendirmede mandibular retrognati kaynaklı iskeletsel sınıf II ve dişsel sınıf II divizyon I anomaly ve artmış overjet bulundu. Tedaviye fonksiyonel aparey olan hızlı üst çene genişletmesi ile başlandı. 6 aylık pekiştirme süresinden sonra mandibular retrognatisi olduğundan aktivatör

apareyi ile tedavisine devam edildi. 10 aylık aktivatör kullanım sonucu mandibuler ilerletme ve sınıf I molar ve kanin ilişkisi sağlandı. Sonuç olarak, dişsel sınıf II divizyon I, artmış overjet olan vakada hızlı üst çene genişletilmesi ve aktivatör apareyi ile yapılan fonksiyonel tedavi sonucunda dişsel sınıf I ilişkilerle birlikte normal overbite ve overjete sahip iyi bir okluzyon sağlanmıştır.

*Anahtar Kelimeler:* Sınıf II div I, artmış overjet, fonksiyonel tedavi

### INTRODUCTION

Class II malocclusion is one of the most common problems seen in orthodontics.<sup>1</sup> This malocclusion is described as a distal relationship of the mandible related to the maxilla with a combination of different dental and skeletal components which can influence facial aesthetics.<sup>2</sup> Generally patients with skeletal Class II show mandibular retrusion with the upper maxilla normally positioned or retruded.<sup>3</sup> As a result of this, the correction of dental and jaw sagittal relationships should be accomplished by advancing the lower jaw. It has been advised that functional appliances that posture the mandible forward (i.e. bite jumping appliances) could be used to obtain a sagittal increase of the lower jaw.<sup>4</sup> Of the many malocclusions, Class II Division 1 malocclusions are the most challenging, and long period of treatment times (>36 months) contribute to an inferior result.<sup>5,6</sup> The traditional treatment approaches involves headgear, functional appliances and/or orthognathic surgery. Functional orthopedic appliances are often used to treat Class II malocclusion originated from mandibular retrusion.<sup>7,8</sup> Appliance choice can contain removable

or fixed functional appliances according to the existing anteroposterior discrepancy, cooperation, and growth period of the patient.

### CASE REPORT

A 9 years and 11 months male patient presented for initial examination at the orthodontic clinic in good general health and no history of serious illness or injury. The chief complaint of the patient was related to the fact that the upper incisors were malpositioned. The patient presented with an Angle Class II, Division I malocclusion, convex profile, 13 mm overjet and 5 mm overbite (Fig.1) The hand wrist radiograph showed that the patient was prepeak skeletal stage (PP2) and panoramic radiograph of the patient didn't show any caries or pathology (Fig.2). The side profile X-ray and cephalometric tracing showed: normal positioned upper incisors (1-NA=28, 1/NA=5mm), and proclined lower incisors (1-NB=21, IMPA=98), Class II skeletal pattern with mandibular retrognathie, ANB angle=8°, (SNA = 75° and SNB = 67°) and normal mandibular growth in the vertical orientation (SN-GoGn=37°,FMA=26° and Y-axis=72°). A facial evaluation showed

normal positioned lower lip and protruded upper lip. A treatment plan was established, starting with rapid maxillary expansion appliance, with the aim to reduce transverse deficiency of maxilla (Fig 3). The rme screw turned two times a day for the first week, and times a day for following two weeks. Then, activation of rme is achieved. Rme had left in the month for 6 months for retention. After that, the treatment continued with monoblock appliance to correct mandibular retrognathic. The monoblock has an acrylic cap for the lower incisors to provide retroclination. 10 months of monoblock treatment with the correction of the molar and canine relationship and space for tooth alignment (Fig 4). As a result of dental grade II, increased overjet in the case of 1 year and 4 months of treatment as a result of dental class I relationships with normal overbite and overjet has been achieved a good occlusion.

## DISCUSSION

The Class II div I pattern of malocclusion has unique characteristics; such as severe increased overjet, with proclined lower incisors, increased overbite, and retrognathic mandibula or decreased lower anterior face height.<sup>9</sup> Treatment for Class II div I needs careful diagnosis and a treatment plan including esthetics, occlusion, and function. It is crucial to determine patient's facial profile, skeletal pattern, and severity of dental malocclusion in the treatment plan<sup>10</sup>. Depending on the patient's age and growth potential, there are several options for treating this malocclusion, e.g., fixed and functional appliances, headgears, and orthognathic surgery. Rme and activator combined treatment is one of the most common used functional appliance for many years in the treatment of class II division I malocclusion.

Patient can wear appliance full time with little discomfort. The use of monoblock worked for forward placement of mandible as well as for correction of deep bite; acquiring Class I molar and canine relationship; obtaining root axial inclination; satisfactory overjet and overbite; accomplish good intercuspation; enhance facial profile by decreasing facial convexity and increasing anterior lower facial height were other treatment objectives completed. In this case, comparison of pre-treatment and post-treatment lateral cephalogram showed SNA remained unchanged, and SNB increased by 71°. ANB angle reduced up to 4°. Overjet decreased 8 mm.

## CONCLUSION

The result of this case report demonstrates that skeletal class II malocclusion on account of a retruded mandible can be successfully corrected with the help of growth modulation by means of rme and activator combined treatment. It also makes better skeletal bases along with soft tissue profile and gives better lip competence. As each case distinguishes from one another because of growth variability orthodontist just cannot generalized the appliance therapy. It is very important to select the cases carefully because application of knowledge and skills and good patient cooperation ensures long term stable result.



Figure 1: Initial facial and intraoral photographs

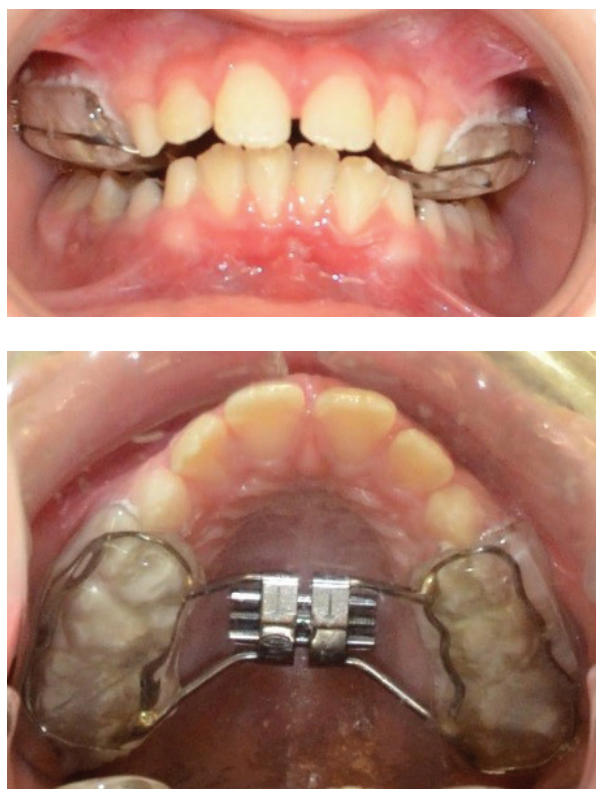


Figure 3: The RME appliance

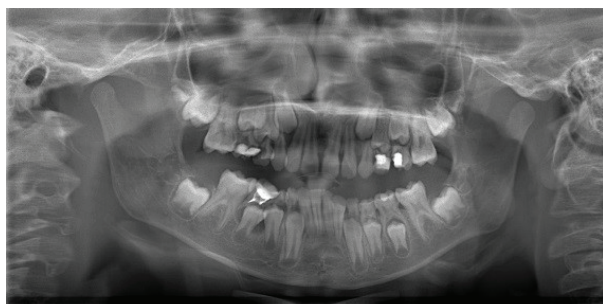
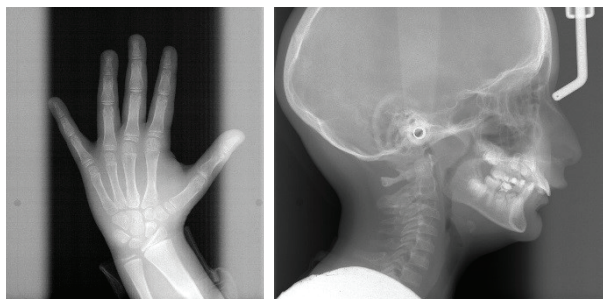


Figure 2: Initial radiographs



Figure 4: The monoblock appliance





Figure 5: Final intraoral and extraoral photograph.

Sagittal	NORMAL	T0	T1	T2
SNA	82° ± 2	75	77	75
SNB	80° ± 2	67	69	71
ANB	2° ± 2	8	8	4
N-A	0 ± 3	-4	1	-4
N-PG	-4 ± 5	-14	-12	-10
Witts	-1 ± 3	7	6	2
SN-GOME	32° ± 7	37	37	38
FMA	25° ± 5	26	24	27
N-ME	114.4 ± 5	97	99	104
Ef.middle face (CO-A)	78	78	82	80
Ef.mand.(CO-GN)	95-97	95	96	96

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