

## Asymmetric Expansion: An Innovative Approach

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### ABSTRACT

Practitioners select expansion treatment appliances based on their personal experiences and on the patient's age and malocclusion. Many attempts have been made to produce greater expansion in the maxillary canine regions. Conventional devices for rapid maxillary expansion (RME) are limited to one direction, along the axis of the expansion screw, and thus cannot provide differential expansion. In this case report, we aimed to expand the maxillary arch asymmetrically according to the requirement of the case.

**Keywords:** Expansion; Asymmetric; Jackscrew

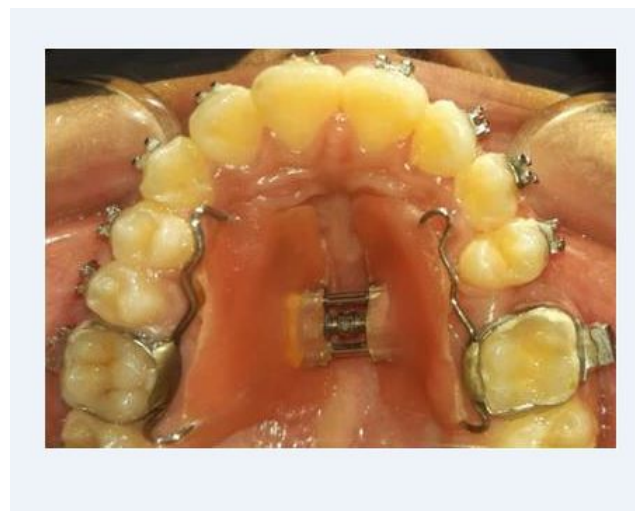
### INTRODUCTION

Maxillary expansion treatments have been used for more than a century to correct maxillary transverse deficiency. The earliest common cited report is that of E.C. Angell published in *Dental Cosmos* in 1860 [1]. Practitioners select treatment appliances based on their personal experiences and on the patient's age and malocclusion [2]. During treatment, transverse forces tip the buccal segments laterally and with proper appliance design, 3rd-order moments will induce bodily translation [3]. Many attempts have been made to produce greater expansion in the maxillary canine regions of CLP patients by changing the design of conventional expanders. Three expansion treatment modalities are used today: rapid maxillary expansion (RME), slow maxillary expansion (SME) and surgically assisted maxillary expansion [1]. Traditionally, adult patients with mild to moderate transverse discrepancies are treated with a combination of slow maxillary expansion with palatal appliances and expanded archwires [4]. The primary goal for this innovation was to expand the maxillary arch asymmetrically according to the requirement and together with fixed appliance.

### FABRICATION AND ACTIVATION

On the working model prepared using Dental Stone, a conventional jackscrew was placed on the mid palatal suture in premolar and molar region. The arrow for activation was placed anteroposteriorly for easy compliance of the individual. Appropriate sized bands were placed on the 1st molars. A wire

work on each side contouring onto the cervical aspect of the 1st molar, 2nd premolar and 1st premolar was made using stainless steel round wires. The gauge of wire used on both side were different with heavier wire (18 gauge) on the side requiring more expansion and lighter wire (22 gauge) on the other. Both the wire component and the jackscrew were connected using self-cure acrylic and the whole appliance was soldered with the molar bands for its stability in the oral cavity. (Figures 1A and 1B)



**Figure 1A :** Appliance design on working model consisting of a jackscrew and two wire components.

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**Figure 1B:** Appliance seated in the arch with the help of molar bands .

The appliance fabricated was then cemented in the patient’s maxillary arch along with bonding rest of the maxillary arch dentition using 0.022” slot MBT bracket system. Patient was asked to activate the screw at the rate of 1 turn/day for two weeks. After a follow up and religation of the archwire, the patient was further instructed to activate the same for another 2weeks to get the desired amount of expansion.

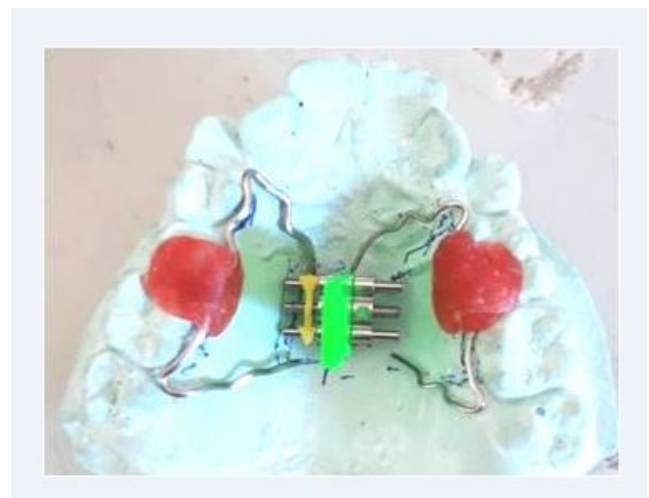
On evaluating the pre and stage models it was found that a total of 6mm expansion was achieved in both premolar and molar regions, with 4mm on the right side and 2 mm on the left. Crowding was fully relieved and a space of 2 mm was available in between the 1st premolar and 1st molar of the 2nd quadrant which was further consolidated by protraction of the molar keeping in mind the midline. (Figures 2A-2C)



**Figure 2A:** Appliance cemented along with bonding at the start of the treatment.



**Figure 2B:** Appliance after two weeks of expansion.



**Figure 2C:** Appliance after one month of expansion.

#### DISCUSSION

Slow maxillary expansion techniques produce minimal tissue resistance surrounding circummaxillary structures and, hence improve bone formation in the intermaxillary suture site. This therefore theoretically eliminates or reduces the limitations of Rapid maxillary expansion [5,6]

Expansion of the maxillary arch and the maxillary dentition may be achieved using multiple appliances. Factors influencing are the type of skeletal and dental pattern; influences the type of expansion to be chosen. Furthermore, the type of expansion selected can greatly facilitate the overall treatment objective [7-9].

#### CONCLUSION

On evaluating the pre and stage models it was found that a total of 6mm expansion was achieved in both premolar and molar regions, with 4mm on the right side and 2mm on the left. Slow maxillary expansion techniques produce minimal tissue resistance surrounding circummaxillary structures and, hence improve bone formation in the intermaxillary suture site.

#### ADVANTAGES

The use of jackscrew for expansion was cost effective and fulfilled the intent of slow expansion.

Different gauge wires produced different amount of forces on the dentition causing asymmetric amount of expansion as required for the individual.

Subsequent bonding of the arch also helped in simultaneous leveling and aligning reducing the treatment time in total.<sup>10</sup>

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