

# RAPID MAXILLARY EXPANSION USING THE SPIDER SCREW ORTHODONTIC EXPANDER

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## REZUMAT

Expansiunea maxilară rapidă cu ajutorul șurubului păianjen este o metodă eficientă de a obține spațiul necesar alinierii dinților ectopici în tratamentul anomaliilor dento-maxilare. Datorită faptului că acțiunea principală a șurubului păianjen este exercitată în zona posterioară a arcadei dentare, indicația sa majoră se regăsește în tratamentul ectopiei de canin. După ce s-a obținut spațiu suficient prin expansiune maxilară rapidă se poate trece la alinierea corectă a caninului.

**Cuvinte cheie:** anomalii dentomaxilare, expansiune rapidă, șurub păianjen

## ABSTRACT

Rapid maxillary expansion done with the help of the spider screw is an efficient method to obtain the necessary space to correctly align ectopic teeth in the treatment of cranio-facial disorders. Because the spider screw's main action is exerted on the anterior part of the dental arch its major indication is found in the treatment of the ectopic canine. After the expansion procedure we obtained the necessary space to correctly align the canines.

**Key Words:** dento-facial deformity, nonextractoral techniques, rapid expansion, spider screw

## INTRODUCTION

The normal development and growth of the children's maxillary is often disturbed causing cranio-facial skeletal disorders.<sup>1-3</sup> One of the most frequent disorders is the discrepancy between the dimensions of the alveolar arch and the size of the teeth.

In order to obtain proper space for the alignment of the teeth, the basic orthodontic therapies in these cases are divided in two major groups: extractoral and nonextractoral treatments.

Correcting the transversal discrepancies as well as the dental arch perimeter enlargement by

nonextractoral techniques is a major issue concerning the orthodontic specialists.<sup>4,5</sup> The interest for rapid maxillary expansion has grown in the last years, and although the dental effect is the easiest to perceive, the enlargement of the skeletal structures of the base of the skull is also very important.<sup>6</sup>

The "spider screw" is an orthodontic appliance used in the rapid maxillary disjunction produced by Leone inc. - Italy.

As a result of the collaboration between the Department of Pedodontics-Orthodontics of Timisoara School of Dentistry and Prof. Dr. N. Veltri from the University of Milan, we introduced the treatment of class I and class II craniofacial disorders through rapid expansion techniques, especially the "spider screw technique".

## MATERIAL AND METHOD

The studied group consisted of 8 subjects with transversal maxillary growth disorders. Our purpose was to split the mid-palatine suture, enlarge the transversal diameter of the maxillary anterior arch thus

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maintaining the posterior transversal diameter unchanged.

#### Appliance description:

The spider screw orthodontic expander is a metallic rust free biomedical appliance which consists of:<sup>7</sup>

- 2 symmetrical medial components each having two arms attached by laser suture. At the end of each arm there is an orthodontic band.

- an expansion screw that unites the two medial components and allows them to move off.

The screw is divided into 3 parts:<sup>7</sup>

- a posterior joint which permits the anterior opening;

- 2 antero-lateral segments that control the expansional movement.



Figure 1. The spider screw in position fixed on a study cast

#### Clinical case report:

Patient S.M. age 12, was clinically examined and diagnosed with class II division 2 dento-facial deformity, associated with unilateral cuspid ectopy



Figure 2. Preliminary study cast showing the lack of space for a correct dental alignment of the two cuspids

#### Treatment goals:

- obtaining the necessary space to correctly align the dental arch;

- obtaining a three dimensional neutral occlusion.

After the measurements made on the study cast, we determined a lack of space greater than 5 mm. We decided to use the spider screw for enlarging the upper arch perimeter by splitting the mid-palatine suture in the sinfibrosis or fibrosinartrosis state, knowing that the complete ossification of this suture is perfected during age 18-20 in boys and exceptionally at age 14 in girls.<sup>8,9</sup>

In this case the support teeth on which we fastened the orthodontic bands were the first upper bicuspid and the first upper molars:

26 - 2-4 / 14 - 16.

This appliance can also be used in primary dentition, when it can be fastened on:<sup>10,11</sup>

55 - 54 - 53 / 63 - 64 - 65

or in transitional dentition fastened on:

16 - 55 - 54 / 64 - 65 - 26

The activation protocol is the following:<sup>7</sup>

- immediate activation after fastening with a maximum opening of 0,8 mm;

- the following day is activated a quarter of turn three times a day (morning, noon and evening);

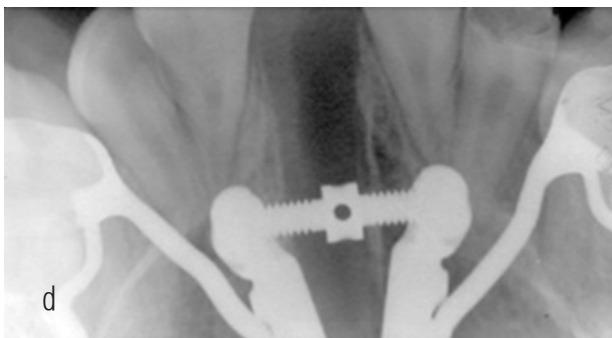
- the activation period lasts for 7 - 9 days;

- the expansion is considered to be adequate when after a complete turn a transversal opening of 2 mm is obtained;

- the mid-palatine suture is considered opened when a central diastema becomes evident between the central upper incisors and the radiographic image supports the clinical aspect;

- after the mid-palatine suture is split the screw is blocked in position with composite material or wire ligament;

- contention must be maintained for 6 month, otherwise the diastema closes spontaneously in a few weeks, and the suture closes in two month by osseous apposition.



**Figure 3.** The final aspect after expansion, note the diastema between the central incisors. The split of the mid-palatine can be clearly noticed on the radiographic image.

## **CONCLUSIONS**

1. When properly used the spider screw offers a high success rate.<sup>10-14</sup>
2. Obtaining proper space in the anterior maxillary arch permits the correction of the intercuspid and interbicuspis diameters without prejudicing the molar region.
3. Contention is compulsory for maintaining the achieved results with the spider-screw.
4. Early diagnosis of the dento-facial anomaly with lack of space allows for nonextractional orthodontic treatments.

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