

# THE LEAF EXPANDER®: SIMPLE, NON-COMPLIANT, EFFICIENT AND NON-INVASIVE CROSSBITE IN PAEDIATRIC ORTHODONTICS

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We give space to a preview of Dr Roberto Ferro's Atlas (to be published in 2024), which features the Leaf expander® as its 'star'.

The author has collected numerous clinical cases with various types of transverse deficits, dentures and malocclusions, so that the reader can, by means of key words, identify the case that most closely resembles the one he or she may have to deal with.

The following three cases are presented in an abridged version showing only the pre/post, whereas in the Atlas they will be accompanied by all records.



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## PREFACE BY THE AUTHOR

### ***The orthodontic mainstream, i.e. today's dominant orthodontic thinking***

*For some time now, social as well as educational offerings have been raging about orthodontics using aligners. This has been compounded by orthodontics that 'doesn't take a step' without the use of mini-aligners, even to resolve a transverse discrepancy in mixed dentition.*

*Yet there is simple, inexpensive, highly efficient orthodontics in which the orthodontist does not work as a 'subcontractor to the aligner manufacturers', but thinks for himself.*

*It is the orthodontics of the growing patient, which is by no means the orthodontics of aligners as people try to pass it off, but the orthodontics of using simple, efficient and inexpensive equipment, as in the three cases I am going to propose.*

*Roberto Ferro*

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## INTRODUCTION

In this preview of the Atlas, three cases in mixed dentition of the need for expansion of the upper arch were reported. The cases all differ from each other; the first concerned the resolution of a functional posterior crossbite, the second corrected a bilateral contraction in a patient with a Class II, 2nd division malocclusion, and finally the third documented the successful treatment of a functional anterior crossbite.

In all three cases, 450 g and 6 mm appliances were successfully used with resolution of the malocclusion within 4 or even 3 months. The Leaf Expander® is an appliance that, in the author's professional practice, has progressively replaced the rapid expander, so much so that it is considered the method of first choice when correcting an orthodontic discrepancy in the transverse plane.



FIG. 2: Leaf Expander® device

FIGURE 1 - Unilateral right crossbite in deciduous dentition. Drawing taken from the book *"The deciduous dentition: where orthodontics begins"* by Roberto Ferro, Ed. Martina - Bologna 2022

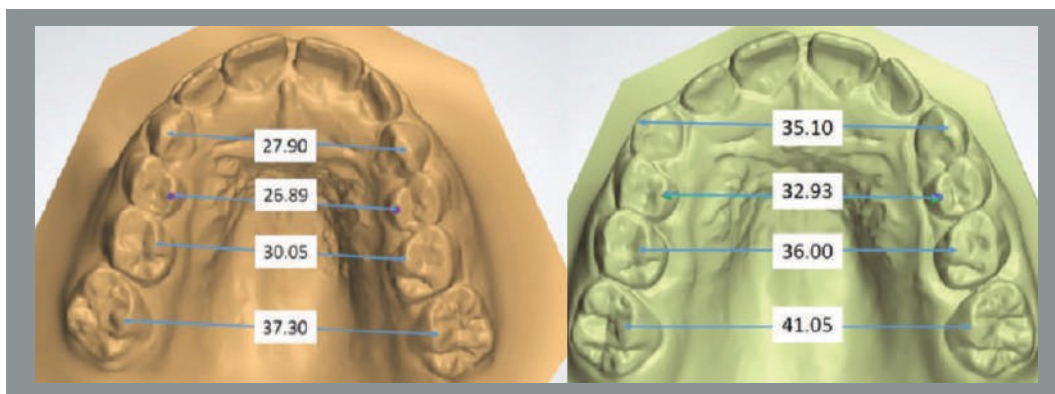


FIG. 3 - Courtesy Dr. Valentina Lanteri.

In the superimposition of three-dimensional digital models (study conducted on 10 patients with mixed dentition) after expansion with a 6-mm, 450-gram Leaf Expander® anchored to the E's of patients, the increase in the amplitude of the transverse diameters is almost constant proceeding from the C's to the E's; the increase in the transverse diameter of the molars, which is smaller, is due, as in the case of rapid expansion, to a remodelling of the upper jaw (Lanteri V. 2017, 2018)

## CASE 1

### Joanna, age 8/9 - Use of the Leaf Expander® for functional posterior cruciate bite

Almost 9-year-old girl who is completing the second phase of the Class I molar permutation on the left side, interincisive lines not coinciding with the functional monolateral posterior crossbite on the right side extended from the lateral incisor to the molar (obviously on the right side it is Class II - consequently it is a functional subdivision on the right). She was treated with 6 mm Leaf Expander® and 450 grams cemented on the first molars with the addition since the second month of a 2x4. The treatment lasted a total of 4 months and the patient is checked with some regularity every six months. The exchange is now complete and the patient, as well as her parents, are satisfied with the result.

#### SEPTEMBER 2018



FIGG. 4a-d - Clinical photos before treatment



FIG. 4b



FIG. 4c



FIG. 4d

#### FEBRUARY 2019



FIG. 5: Cementing a Leaf Expander® (450 grams and 6 mm)

#### APRIL 2019



FIG. 6 - Leaf Expander® fully reactivated (2 months for pre-programmed expansion)

**JUNE 2019**



FIGURE 7 - After 4 months, everything is removed: no restraint is delivered. Let "nature take its course" by performing some lower arch slicing.

**SEPTEMBER 2021**



FIG. 8 - Exfoliation of 75 is expected; generalised gingivitis due to poor oral hygiene is present

**NOVEMBER 2022**



FIGG. 9a-c - End of exchange; treatment lasted 4 months



FIG. 9b



FIGUR  
E 9c



FIG. 9d

## COMPARISON BEFORE AND AFTER TREATMENT



FIG. 10 - February 2019: before treatment



FIG. 11 - November 2022: after treatment, at the end of the exchange

## JULY 2023



FIGURES  
12a-c



FIG. 12b



FIGURE  
12c

## CASE 2

### Gloria, age 11 - Use of the Leaf Expander® within a more complex treatment

Eleven year old who is completing the third phase of the exchange, presents a Class II, 2 left subdivision with crossbite at molar level and 7 mm lower crowding. She was initially treated in the upper arch with a 450 gram, 6 mm Leaf Expander® and in the lower arch with a Clark's Transforce-like appliance (LTO laboratory in Padua) aimed at recovering space in the frontal sector by increasing the inter-canine diameter. After 4 months, the Leaf Expander® was removed and, once the inferior alignment with the "transforce-like" was completed, treatment with a fixed appliance using the straight-wire "STEP" technique was carried out. After two years, the case was brilliantly resolved, remaining stable over time, thanks to the use of removable restraints (Van der Linden plate superiorly) and Hawley's (inferiorly).

### MARCH 2019



FIGG. 13a-f - Clinical photos before treatment



FIG. 13b



FIG. 13c



FIG. 13d

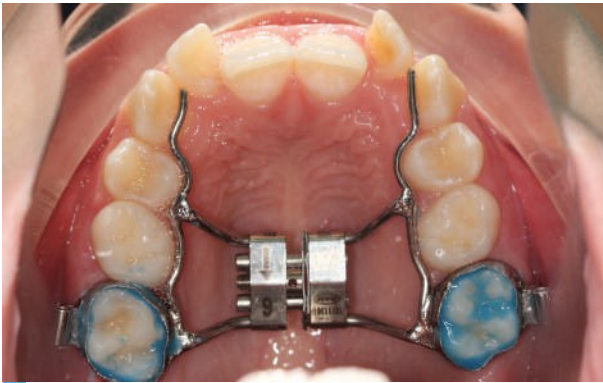


FIG. 13e



FIG. 13f

**MARCH 2019**



FIGG. 14a, b - Cementing a 6 mm, 450 g Leaf Expander®



FIG. 14b

**APRIL 2019**



FIGG. 15a, b - A 2x4 with .012 Ni-Ti bow is added; the leaf springs have not yet fully opened



FIG. 15b

**MAY 2019**



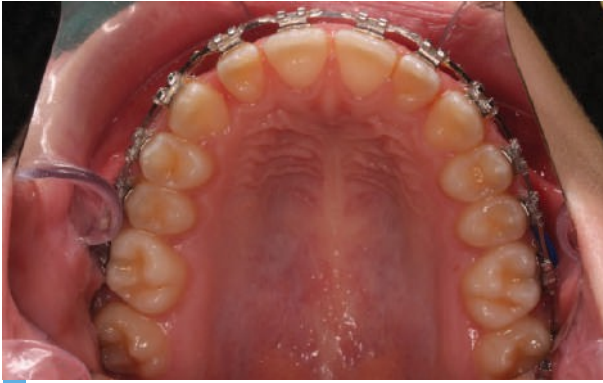
FIG. 16: The Leaf Expander® is reactivated

**JUNE 2019**



FIG. 17: Extracts 55 and 65 and decides to remove the Leaf Expander® (teeth are aligned)

**JANUARY 2021**



FIGG. 18a, b - When working with elastic TBKs

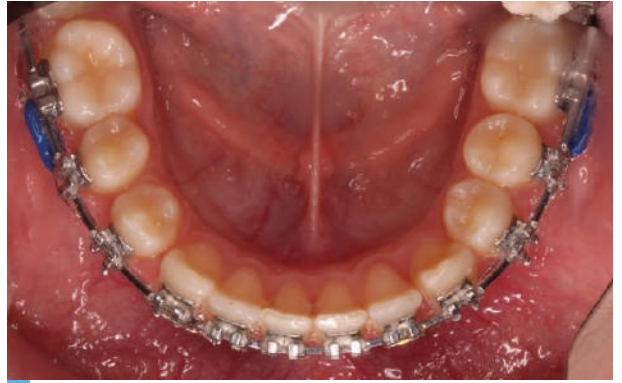


FIG. 18b

**MARCH 2021**



FIGG. 19a-g - End of treatment



FIG. 19b



FIGURE  
19c



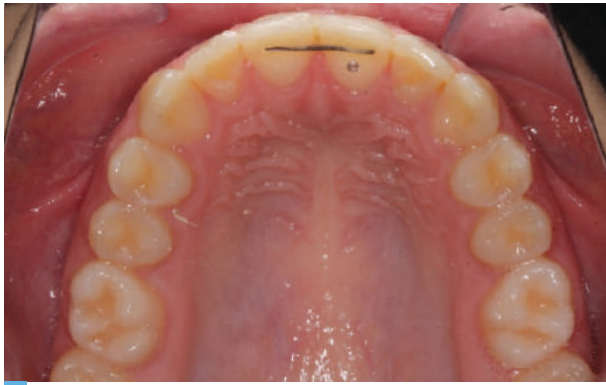


FIG. 19d



FIG. 19e



FIG. 19f



FIG. 19g

**JUNE 2023**



FIGG. 20a-c - Control at 27 months



FIG. 20b



FIG. 20c

### CASE 3

#### Antonio, age 7: Use of the Leaf Expander® for functional anterior cruciate bite

Antonio is a 7-year-old boy in the first stage of the exchange who presents with a functional anterior cruciate bite. The canine to molar relationship is Class I.

After three months of the 450 gram, 6 mm Leaf Expander®, the front assembly was 'scrounging'. The patient was checked during the exchange, which went smoothly.



FIGG. 21a-d - Initial situation



FIG. 21b



FIG. 21c



FIG. 21d

#### 3 MONTHS LATER



FIGG. 22a-f - Anterior cruciate bite resolved after 3 months with a 450 g, 6 mm Leaf Expander®



FIG. 22b



FIG. 22c



FIG. 22d

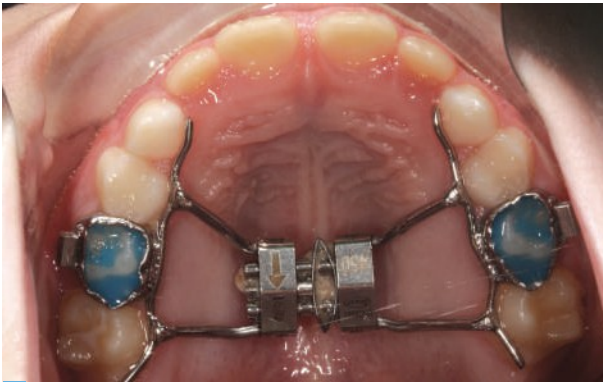


FIG. 22e



FIG. 22f

**6 MONTHS LATER**



FIG. 23a-f - LeafExpander is removed: completed first phase of exchange



FIG. 23b



FIG. 23c



FIG. 23d



FIG. 23e



FIG. 23f

**AT THE END OF TREATMENT**



FIGG. 24a-g - When the exchange is almost complete



FIG. 24b



FIG. 24c



FIG. 24d

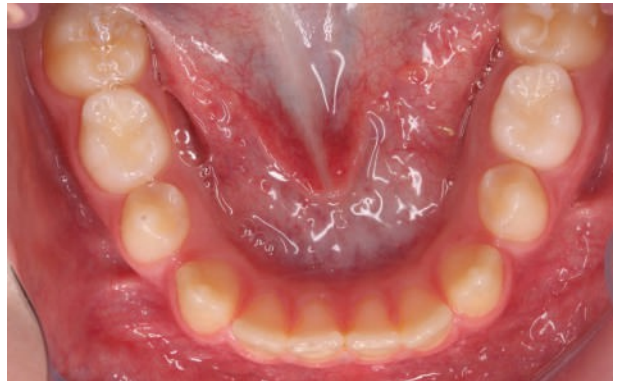


FIG. 24e



FIG. 24f



FIG. 24g