Distalization using the FAST BACK

Requirements, ideas, comparison and application

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Modern orthodontics is continually searching for new treatments which conserve the dentition of the patient. This has led to an increasing tendency to avoid, as far as possible, any treatment that involves extractions. The disadvantage of this is that there is no space readily available in the arches, resulting in a need for appliances which can create or enlarge the space required by acting both in a transversal and distal direction. Many appliances designed to retract the upper molars have recently been brought onto the market in an attempt to resolve this problem. Italian researchers have distinguished themselves in this field and have achieved excellent results. One of the main reasons for their commitment is undoubtedly the considerable difficulties experienced by clinicians in gaining the patient's cooperation if extraoral headgear, the conventional distalization appliance, is prescribed. It is therefore necessary to develop distalization appliances to replace the headgear.
In our opinion, the ideal distalization appliance should include the following features:

- no requirement for cooperation on the part of the patient
- a high degree of biomechanical control
- minimum loss of retention
- extremely compact design
- minimum interference when masticating, swallowing or speaking
- no impairment of aesthetics
- no pain or feeling of tension during distalization of the teeth.

Fig. 1, 2 Initial clinical trials carried out unilaterally using existing materials. The therapeutic results confirm theoretical expectations. Note the tripod anchorage which, together with the preadjustable force of the **Memoria®** *spring, enables optimum biomechanical control.*

Fig.1

Fig.2

Fig. 3 A similar case to the preceding one, except that a special screw is used.

Fig. 3

DISTALIZATION APPLIANCES	
Appliances	**Frequently occurring problems**
- **Extraoral headgear** **- Distal Jet** **- First Class Leone** **- Veltri retractor** **- Locasystem** **- Jones Jig** **- Wilson arch** **- Hilgers' Pendulum appliance**	- Patient cooperation - Discomfort due to the size of the appliance - Force not continuous - Inadequate control of the amount and direction of force results in rotation, tipping and/or undesired palatal orientation of the molars - Problems activating the components - Inadequate stability of the appliance - Frequent loss or damage because components are too small - Tooth movement continues after completion of the treatment - Impossible to treat both sides of the jaw separately - Impossible to treat in conjunction with vestibular brackets during distalization - Cooperation is required from parents for activation, increasing the risk of errors - Increased risk of decubitus - Problems cleaning the appliance

- Easy and gradual activation by the operator
- Completely safe treatment
- Automatic stop of the orthodontic movement
- Simple construction
- Compatibility with different orthodontic techniques
- Easily cleaned

In our many years of working daily with very different appliances we were able to gather a wealth of personal experience and carry out evaluations which encouraged us to develop the **Fast Back**. This new orthodontic distalization appliance is customised for each patient and consists of specially developed and fabricated components.
The table gives a summary of our observations on the distalization appliances we used and assessed. In 1999 we began development work on our project for a new distalization appliance which was intended to overcome at least some of the negative features of previously tested appliances.
The project was intended to achieve the following aims:

1. produce an appliance that the patient does not have to activate at home
2. enable precise regulation of the degree and direction of the forces applied
3. provide the option of using vestibular appliances during distalization
4. guarantee good retention during and after distalization
5. reduce the number of activations required
6. simplify the activation procedure
7. guarantee reliability when in use by excluding the possibility of over activation
8. allow different treatment options on both sides of the jaw
9. guarantee a high degree of tolerance on the part of the patient and no impairment of aesthetics by the appliance.

Thanks to the combination of clinical experience (Dr. C. Lanteri and his orthodontic team) and technical expertise (Filippo Francolini - Firenze Ortodonzia laboratory) and the availability of the most up-to-date production technology (Leone in collaboration with the research and development department led by Gabriele Scommegna with technicians Riccardo Sinibaldi, Andrea Morgia and engineer, Maurizio Dolfi), several prototypes of the distalization appliance, which we called **Fast Back**, were developed in the early months of 2000.
Following a trial period of approximately 18 months for the various prototypes, the final version of the appliance was developed. In our opinion, this version included all relevant features and was therefore ready to be presented to orthodontic colleagues.
Some of these prototypes are shown in the photographs accompanying this report to illustrate the individual stages of the research and development work carried out on this appliance during the trials. The final photographs of the **Fast Back** show the finished version of the appliance with the special screws and components manufactured by Leone.

Fig. 4, 5 – Clinical trial of a sagittally placed rapid expansion appliance to achieve bilateral distalization. In this case, the molar distalization also resulted in a minimum loss of retention.

Fig.4 *Fig.5*

*Fig. 6, 7 – The Fast Back, seen here in situ, comprises two special screws, small tubes on the molars and **Memoria**® springs. The integrated Nance plate incorporates retraction screws in the anterior section to ensure that the appliance has good anchorage and excellent stability.*

Fig.6 *Fig.7*

SUMMARY DESCRIPTION OF THE FAST BACK APPLIANCE FOR MOLAR DISTALIZATION

The **Fast Back** was fabricated according to the principle of placing forces on the molars by incorporating **Memoria**® springs which deliver a constant force (each pack contains two springs with different forces of 200g and 300g for different orthodontic requirements).
To achieve this result, while still enabling precise control of tooth movement and ensuring the greatest comfort possible for the patient, an arm is fabricated to fit into a small tube (1.1 mm diameter) which is soldered onto the

palatal surface of the bands on the molars to be distalized. An open **Memoria®** spring is added to the arm and delivers the required force to move the tooth in the desired direction, which is determined by the arm sliding inside the tube. The spring must be reactivated after the tooth has retracted approximately 1.5 – 2 mm: the operator activates the distal screw as required so that it compresses the spring again (after distalization has begun, activation should be carried out, on average, every 30 – 45 days).
A Nance palatal pressure button, which also contains the anterior components of the screws, ensures stability of the anterior region and anchorage.
This design allows the **Fast Back** to deliver continuous, preset forces (option of two types of springs, 200g and 300g). The direction of the spring is determined by the arm on the expansion appliance and does not require the cooperation of the patient during treatment.
The **Fast Back** also has a self-locking terminal stop, which makes the appliance fully programmable and considerably increases its safety during use.

KIT FAST BACK

DESCRIPTION	CODE NUMBER	Q.TY FOR PKG.	CLASS
KIT FAST BACK	**A1760-91**	1	03
ARM BENDING INSTRUMENT FOR FAST BACK	**P1622-00**		

Fig. 8

Fig. 9

Fig. 10

Fig. 8, 9, 10 – Fast Back on the model, coil spring in detail, Fast Back Kit

ALL REPLACEMENT PARTS FOR FAST BACK KIT (A1760-91) ARE AVAILABLE IN REFILL PACKAGES

DESCRIPTION	QTY.OF KIT	REFILL PART NUMBERS	QTY. FOR PKG.	CLASS
DISTALIZER 9MM UR	1	**A1760-09**	1	03
DISTALIZER 9MM UL		**A1761-09**		
SPHERICAL ENDS	4	**A1763-00**	10	
SPRING COMPRESSION RINGS		**A1763-01**		
MEMORIA® COIL SPRINGS 200 G	2	**A1763-02**		

MEMORIA® COIL SPRINGS 300 G		**A1763-03**		
MIM® PALATAL TRUBES 1,1 mm DIAM.		**A1730-04**		
KEYS	1	**A1763-04**		11
SAFETY RING LEASH FOR KEY		**A0557-02**	100	03