FEATURE ARTICLE
ALF (Advanced Lightwire Functionals): Some Basics of Design and Activation

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BASIC ALF DESIGN

While the ALF has common design features with other wire appliances it has a few peculiarities that need special attention. The basic design for an upper ALF uses cribs on the 1st molars and crescents around the canines. The body wire has three loops, an anterior and two lateral ones. (Figure 1)

There are almost endless variations of the design possible but it may be well worth any dentist’s time to first gather experience with the basic design. The reason for placing the crescents on the canines is as follows: the ALF appliance uses the teeth as handles to affect the alignment of cranial bones; the first phase of treatment is usually freeing up the pre-maxilla (which is particularly important for pain patients). The first activation helps to achieve this by gently wedging the canines apart. The illustrations show the adjustments step by step.

FIRST ALF ACTIVATION

The flexibility of the Elgiloy yellow body wire and the small loops that are bent in different planes add some challenge to adjusting the ALF.

This is how I make the adjustments: first place the ALF with the tissue side facing up in a little zip lock bag, put it on the photocopy machine and make a copy that will serve as a reference. (Figure 2) The zip lock bag takes care of infection control and prevents scratching of the copier’s glass plate.

Use a pair of high quality bird beak pliers with inserted tips (e.g. from Masel Orthodontics) that allow for a tight grip of the appliance (this becomes critical when doing adjustments that require two pairs of pliers). Next hold the ALF such that you can see from the side how the body wire aligns. In most cases the right and left lateral sections are on the same plane. Also pay attention to the angle of the cribs relative to the body wire. (Figure 3)

Hold the ALF between your fingers, place the bird beak pliers in the anterior loop with the flat side of the pliers touching the concave portion of the loop. (Figure 4) Hold the pliers at a 90 degree angle to the base portion of the loop and verify the accuracy by looking at the ALF from the side.

Give the wire a light squeeze. As opposed to a rigid wire the Elgiloy yellow wire will rebound after you release the pressure from the pliers. That is where the reference copy comes in handy: line the ALF up as if you are looking at the patient’s palate, write ‘R’ (right) and ‘L’ (left) on the reference sheet to make sure you don’t get confused as to which side you are looking at. Next see how much wider the anterior loop is and how the molar cribs have come closer together. Verify that you have maintained the same horizontal plane by eyeballing the body wire from the side. Failing to pay attention to that you can introduce severe distortions of the appliance which will translate into unintended and unfavorable cranial effects. (Figure 5). A good measurement for the first adjustment is to widen the anterior loop about 1 mm.

Figure 1 - Basic ALF appliance

Figure 2 - Photocopy of the ALF appliance before activation; U0 stands for ‘U’pper appliance, 0 adjustments done
At the first adjustment keep the transverse width between the molars neutral (Pont’s measurement ‘M’). To achieve this it is necessary to compensate for the fact that the molar cribs come closer together as you widen the anterior loop. This can be done in two ways: either hold both molar cribs with your fingers and gently pull the appliance apart until you are back to ‘neutral’. This method, ‘finger pull’, works best to maintain the molar width. It is not the best way to increase ‘M’. The second way of restoring the original width between the molar cribs is to use pliers at both top corners of the anterior loop and gently squeeze until you reach the desired width. (Figure 6). Always check with your reference copy and verify the horizontal plane from the side.

The reason that the activation with pliers works better to increase molar width is that you bend the wire beyond its point of elasticity, creating a fulcrum at the point where you squeezed. The ‘finger pull’ activation distributes the force over more length of the body wire, resulting in even gentler forces that may be insufficient to achieve transverse development in the molar region.

**KEEPING TRACK OF WHAT YOU ARE DOING**

After you are done with adjusting the ALF place it on the copy machine again to obtain another reference that you will use at the patient’s next appointment. With arrows, other symbols and some key words you can mark on this copy what you did today and what changes you expect to see at the next visit. You can also mark where you placed resin ledges which are necessary at times to secure the ALF in place. Not only will this little graph speak more than 1.000 words when you see your patient again, it is also a great learning tool. (Figure 7).

**CAVEAT**

This article describes one way of doing the first adjustment. Other practitioners may have different preferences as to the use of pliers, finger-pull or a combination of it. This is simply my way of doing it.

During the course of treatment other adjustments are made according to the patient’s needs.