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CLINICAL SECTION

Clinical pearl: LingLock™—the flossable fixed retainer

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The present article describes a new product for long-term retention of the lower dental arch. The LingLock™ is a fixed bonded retainer from canine to canine in the lower front made up of separate, but co-working retention elements in the ceramic material aluminium oxide (Al_2O_3). The LingLock™ retainer enables the patient to floss the teeth in a regular manner in the actual retention area.

Key words: Retention, lower front, ceramic elements, flossing

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Introduction

The mandibular anterior region is the most common area for post-treatment relapse and crowding. The development of incisor crowding is highly variable and unpredictable.[1,2] It has not been possible to find clinical predictors to decide whether a patient needs long-term retention or not.[1–3] Several orthodontists advocate long-term retention of the lower anterior teeth, and many different removable and fixed retainers have been introduced for this purpose.[3–6]

The present article describes a new concept for long-term retention of the lower anterior teeth, based on a concept of interlock retention. The development of this project is part of a research and developmental programme supported by the Norwegian Research Council. The aim is to develop the concept of interlock retention into an orthodontic product. The initial development was undertaken in private practice, and the continued research and developmental programme is being conducted in collaboration with the Department of Orthodontics, University of Bergen, Norway. Depending on the results from the ongoing randomized clinical trial, it is anticipated that the product is soon to be made commercially available under the trade name LingLock™.

The main objective of the development of the LingLock™ retainer has been to create an appliance for long-term retention of the lower anterior teeth without increasing the risk to the patients of developing periodontal disease or caries in the actual retention area.

Additional objectives have been to:

- improve aesthetics;
- increase patient comfort;
- reduce the laboratory work and chair time;
- reduce the risk of accidental breakage;
- facilitate repair.

The LingLock™ retainer and its placement

The LingLock™ retainer is made up of pairs of separate, but co-working retention elements constructed in ceramic aluminium oxide (Al_2O_3). It therefore has similar radio-opacity to a ceramic bracket. Pairs of elements are bonded to the lingual aspect of the lower anterior teeth from canine to canine.

Retention is created by intimate contact of the complimentary shaped and outlined contact surfaces of the retention elements. These are co-working interlocking, male and female parts (see Figure 1).

An application tool has been developed to assist in placement of the retention elements. The application tool consists of a retention element holder and an application strip. The retention element holder and the application strip ensure that the contact surfaces of the retention elements have the correct position both in relation to each other and in relation to the tooth pair to be bonded (Figure 2).

Before bonding, a LingLock™ retainer, any calculus should be removed and the bonding area should be cleaned carefully. As with any bonded attachments moisture

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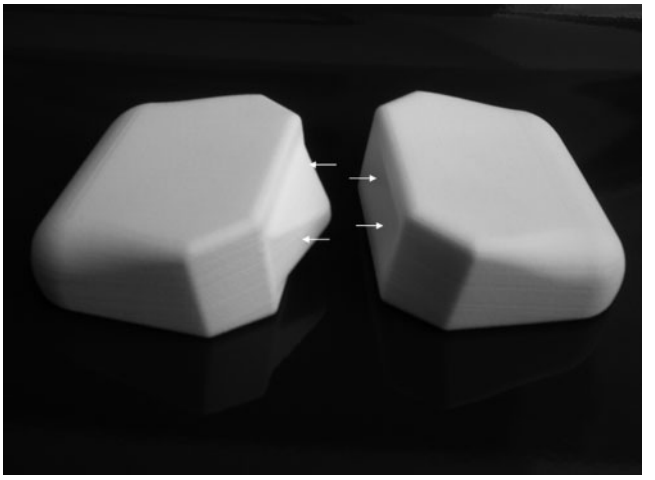

Figure 1 Retention is created by intimate contact of the complimentary shaped and outlined contact surfaces of the retention elements (arrowheads)

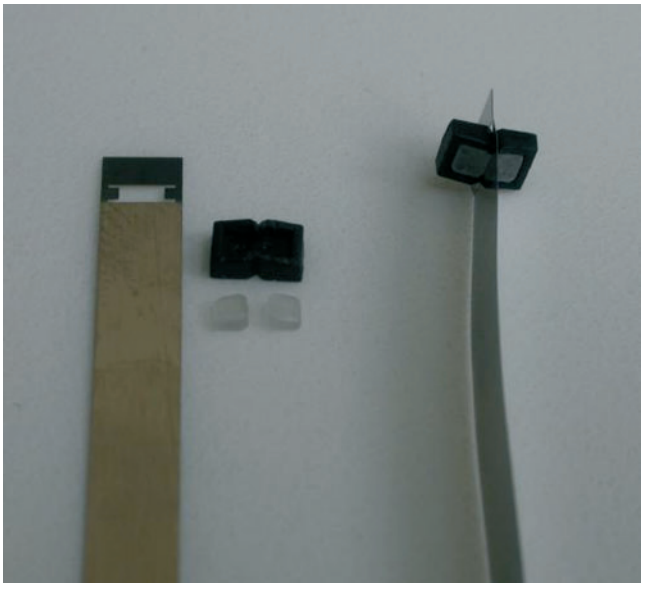

Figure 2 A LingLock™ retainer consists of a retention element pair situated in a retention element holder, which again is mounted on an application strip

control is critical. The teeth to be bonded are pumiced, etched with a 37% phosphoric acid, rinsed and dried.

Transbond™ Plus (3M Unitek) is applied to the teeth to be bonded and Transbond™ XT (3M Unitek) is applied to the LingLock™ retainer.

When bonding the LingLock™ retainer, the application strip is guided in between the approximal surfaces of the neighbouring teeth. The LingLock™ retainer is brought into tooth contact and the guide strip is used to establish the position in superior/inferior direction. A John Nielsen hand instrument is used to make any

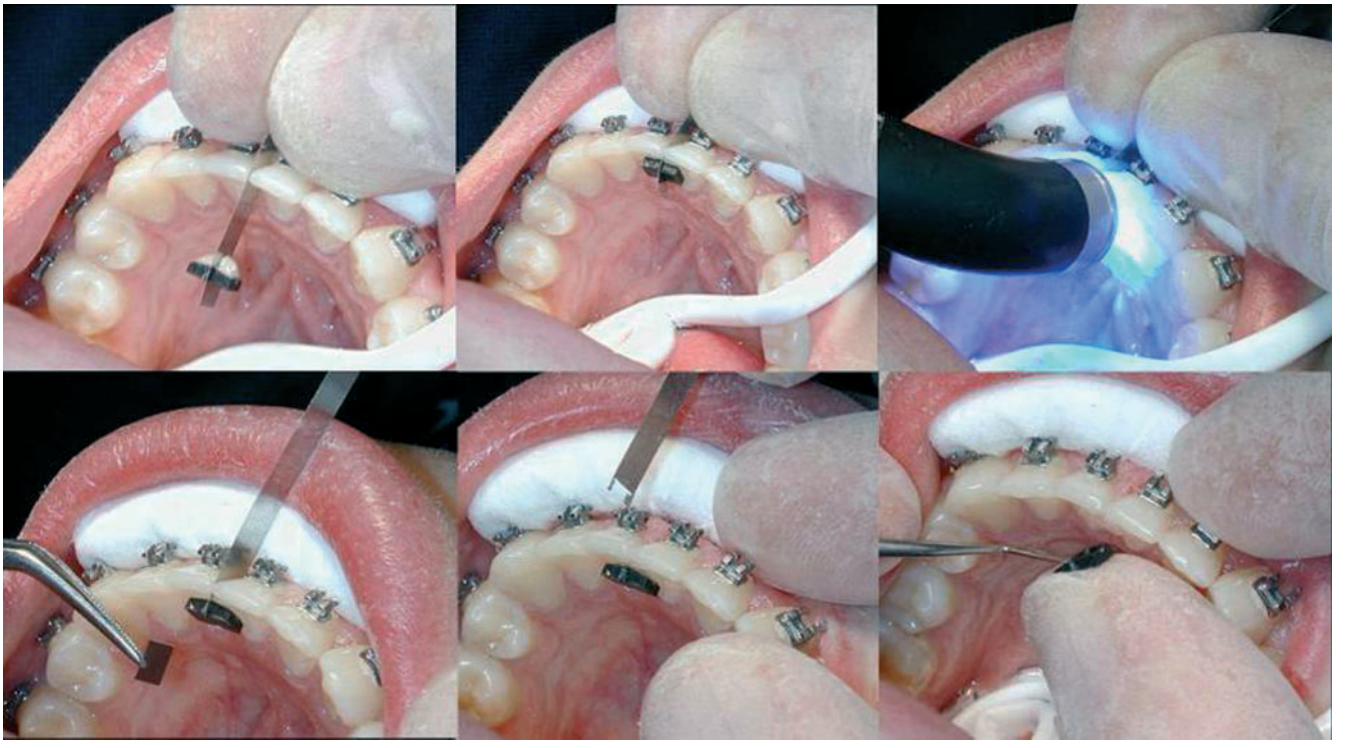

Figure 3 The application strip is guided in between the approximal surfaces of the neighbouring teeth and the LingLock™ retainer is brought into tooth contact before the composite is light cured. The application strip is then removed followed by the retention element holder

Figure 4 Five sets of LingLock™ retainers are needed to replace the standard fixed 3–3 retainer

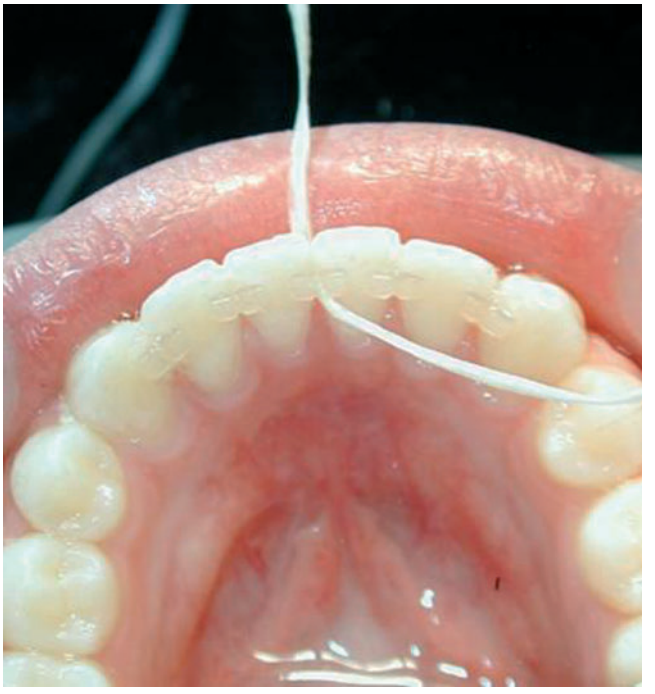

Figure 5 The LingLock™ retainer enables the patient to floss the teeth in the actual retention area

positional corrections in the horizontal plane and to remove gross excess of composite before light curing. The application strip is removed by pulling it forward and slightly upwards until it breaks distal to the element holder, followed by the removal of the retention element holder (Figure 3).

Excess composite is removed using a carbide bur. Five sets of LingLock™ retainers are needed to replace the standard fixed 3–3 retainer (Figure 4). The unique design of the LingLock™ retainer enables the patient to floss the teeth in the actual retention area (Figure 5), while maintaining the incisal alignment.

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