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CLINICAL SECTION

Clinical pearl
Clinical tips with System-R

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The article describes the versatility and ease of use of a relatively new bracket system manufactured by GAC called System-R. This system consists of two bracket types; standard width and reduced width, both of which have an active self-ligating clip. The reduced friction offered by this system allows different mechanics to be employed. Security of ligation and absence of decaying force values allows longer treatment intervals. Fast and reliable opening and closing of the clips means reduced chairside time. Difficulties experienced personally by these brackets are highlighted and some troubleshooting tips are included.

Key words: System-R, self-ligation, active clip, friction

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Introduction

'System-R' (GAC), formerly known as 'In-Ovation', is the world's only self-ligating system that combines a twin bracket with an active clip. The standard sized bracket (Figure 1) became available in 1999 and a reduced diameter bracket for anterior teeth was introduced in 2001.

In the past, many frustrations experienced with self-ligating brackets have been due to failure of the locking mechanism. System-R appears to have resolved this problem and failure of the clip has seldom been reported. If the clip does break, the bracket may be used as a conventional bracket owing to its four tie wings (Figure 2).

Figure 1 Standard In-Ovation bracket with an additional horizontal slot

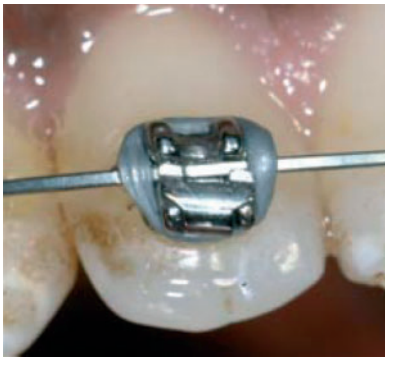

Figure 2 Clip failure

Clinical tips

Open and closing

For opening the clip, the 'Beaver' tool manufactured by GAC is my preference. The instrument is held at 45° to the long axis of the tooth and gentle pressure is exerted to open the clip (Figure 3). It is helpful to start from the left and work round to the right hand side to prevent accidentally closing an already opened clip.

Closing the bracket takes less than 1 second and is achieved by light finger pressure. An audible 'click' occurs when the clip is fully closed. The simplicity of opening and closing the clip allows faster archwire changes and requires less chair-side assistance.

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Figure 3 Opening the clip

Ectopic and severely displaced teeth

The Standard bracket has an additional horizontal slot (Figure 1). This slot may be utilized when aligning displaced or ectopic teeth. Figure 4 illustrates a modification of the 'piggy-back' technique. The base archwire is a 0.018-inch round stainless steel archwire; a light 0.014-inch Sentalloy archwire is threaded through a link of the gold chain and through the horizontal slot of the adjacent brackets. It is simpler than the conventional 'piggy back' technique because the base archwire may be left *in situ* when reactivating the gold chain.

Don't engage second molars during an initial alignment

This system is passive and very low in friction in the initial alignment stages and teeth move very quickly. If second molars are incorporated into the appliance at this stage, it is likely that following alignment, excess archwire will protrude out of the distal aspect of the tube. This will not only increase the risk of soft tissue injury, but in contacting soft tissues may also inhibit anterior alignment and force anterior teeth labially.

Figure 4 Utilization of the horizontal slot

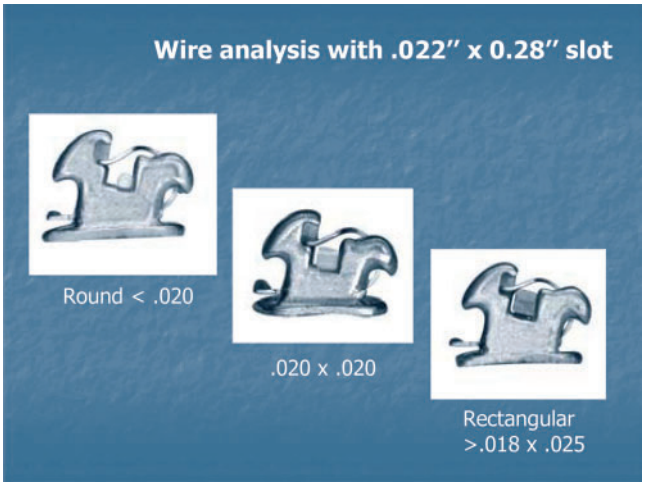

Figure 5 Wire analysis with a 0.22-inch slot

During the later stages of treatment, the clip interacts with the archwire and pushes it against the base of the slot. This means that the lingual aspect of the wire contacts the bracket base allowing torque values to be expressed. Figure 5 illustrates how the clip behaves according to the diameter of the archwire. The clip interacts with the archwire as the diameter exceeds 0.019-inch round or 0.018 × 025-inch rectangular wire.

Mesial-distal movement of teeth on lighter archwires

Owing to the low friction in the early stages of treatment, light forces can be applied for mesial-distal movement of teeth on light archwires. Figure 6 shows NiTi pushcoil with 0.014-inch Sentalloy archwire. There is approximately 2 mm of activation applied to the coil spring. It is an excellent way of expanding arches that are contracted anteriorly.

Bonding

It is essential to remove all excess cement when bonding brackets—any cement left around the clip mechanism may prevent its correct functioning. Consider using light-cured cement or an easily visible colour changing cement.

Prevention of archwire sliding

This is more apparent in low friction systems. My favoured method is to use composite cement on a non-active part of the archwire (Figure 7). Acid etching the wire may achieve more micromechanical retention.

Other methods that may be employed are:

- selective use of elastic modules;
- V-shaped notches on wire;

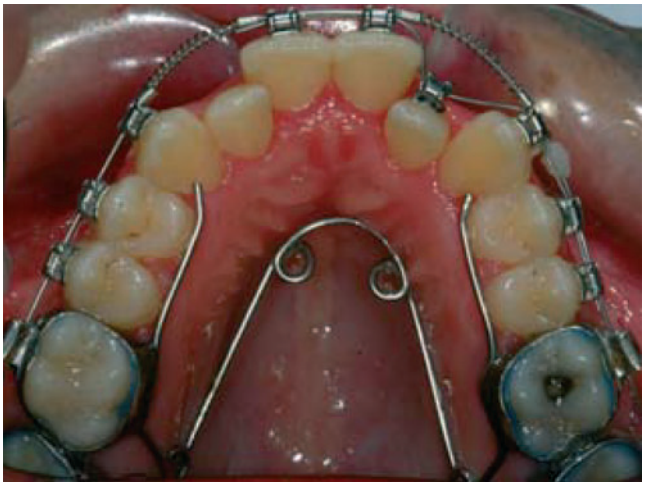

Figure 6 Creation of space for lateral incisors with a 0.014-inch Sentalloy

- crimpable hooks or split tubing;
- bend-backs.

Inability to seat the archwire

In my experience, the reason for not being able to seat a rectangular wire is either due to the clip not being *fully* open or presence of debris in the slot.

Calculus

Don't use this system if patients have a calculus-forming tendency. It is impossible to open the brackets if calculus forms on the clip and removal of adhered calculus risks bracket debond.

Figure 7 Composite to archwire to prevent sliding

Summary

I prefer to use a standard sized twin bracket with an active clip as this combines fast and reliable ligation, low friction in the early stages and precise control in the later stages without compromising the quality of the final result. Security of ligation and absence of decaying forces allows for longer treatment intervals and this, combined with reduced chair-side assistance and time, allows savings to be made in clinical time.

Acknowledgements

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