PG Canine Retraction Spring

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Introduction

PG canine retraction spring was introduced to the orthodontic profession way back in 1985 by Poul Gjessing; it was not widely used till interest in it was renewed in recent years because of its adaptability to the now commonly used 0.018" pre-adjusted edgewise appliance system. The efficient design as well as the relatively rigid stainless steel wire, lends good stability to this retraction spring for use in frictionless orthodontic mechanics.

Canine retraction is a very important step in most orthodontic procedures involving extraction of premolar teeth and is usually carried out by two methods :

- 1) Retracting canines by sliding along a base wire (Frictional mechanics)
- 2) Retracting the canine with a specially designed spring attached to it without any base arch wire for the canine to slide on (Frictionless mechanics)

Contemporary Orthodontics by Proffit [1] describes the PG spring to be the most efficient current design for frictionless canine retraction. Rectangular stainless steel wire with overlapping ovoid loops provide good stability, required moment-force ratio and good load deflection rates. It is constructed in the readily available 0.016"x0.022" stainless steel wire and can be easily placed in the routinely used 0.018" brackets. Construction and placement is easy and so is the activation. Its advantage as compared to other retraction springs is the fact that it can be economically made and used within

the routine inventory of an average orthodontic clinic. Disadvantages are the same as in any retraction spring, in not being failsafe in case of accidental distortion and being liable to irritate the sulcular mucosa at least in the initial few days.

Construction : The PG spring [2-4] is made in 0.016"x0.022" stainless steel rectangular wire. It has gingivally directed overlapping double helices, ovoid in shape, 10mm in height and 5.5mm at its widest part (Fig 1). It also has a small occlusal helix 2mm in diameter. The wire is bent in such a way that the smaller end of the wire is continuous with the occlusal helix. This portion is the canine part and would fit into the canine bracket. As it comes out of the occlusal helix, it is given a 15° gingival turn. After forming the gingivally directed double helices, the longer arm of the wire is the one which is meant for engaging the premolar bracket and the molar tube; this being the molar portion. This posterior molar arm as it exits from the double ovoid loops is turned gingivally such that the wire makes an angle of 12° till approximately the second premolar bracket and then turned up at an increased total angulation of 30° as shown in Fig 1. This portion is also given an anti-rotation bend of 60° towards the canine tooth and then this bend after traversing the width of the spring is curved back in an exactly opposite direction of the initial bend decreasing this to a final 35° (Fig 2).

Placement and activation : The anterior end emerging out from the smaller helix is placed as close as possible to the canine bracket and the front end is cinched. The

Fig. 1 : Right upper PG spring (palatal view)

Fig. 2 : Right upper PG spring (occlusal view)

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Fig. 3 : PG canine retraction spring before retraction

posterior end is placed into the second premolar bracket and then into the 1st molar tube. The spring is pulled back till the double ovoid gingival loops open by 1mm and cinched back. This gives an approximate force of 160 grams. A retraction of 1.5 mm is expected in one month. The PG spring in use is shown in Fig 3 and 4.

The spring induces bodily movement of teeth and anchorage, reinforcement by a Nance button or headgear is needed in moderate to high anchorage cases. A prerequisite before placing this spring is good rotational correction as well as levelling and alignment of the three

Fig. 4 : PG canine retraction spring after retraction

teeth involved.

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