Instrument set for systematic scaling and root planing of periodontal patients

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Scaling and root planing, the cleaning of root surfaces that have more or less plaque/calculus build-up, involves the optimal contact between instrument and root surface, so that an adequate amount plaque/calculus can be removed with a minimal loss of root substance.

As a rule, the degree of periodontal destruction and especially to which extent the molars are affected, has a significant impact on the need for an adequate instrument set. While moderate damage in a premolar dentition often can be treated with a limited number of 'universal instruments', deeper periodontal destructions and pockets around mainly the molars require several instruments as well as knowledge of root morphology and instrument structures.

Unfortunately, the anatomy of tooth roots is complicated, with varying concave and convex surfaces. From a periodontal aspect, the proximal surfaces are the most susceptible, because pathogens usually establish themselves here first, then spread out over neighbouring buccal and lingual/palatal surfaces. Even near the cemento-enamel junction, the root surfaces proximally are more or less concave. This originates during the embryonic stage, when the crown and root are formed from several starting points, i.e. lobes, which then grow together to form a tooth. Even in the root cross-sections of single-rooted teeth, there are proximal concavities combined with buccal and palatinal/lingual convexities due to the existence of lobes (fig.1).

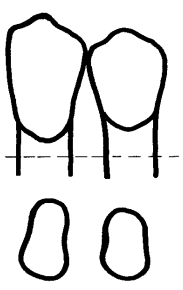

Fig.1 Cross-section of 33 and 34 a few mm underneath the cemento-enamel junction

For supragingival scaling and root planing, primarily the elimination of supragingival calculus from the incisors of the lower jaw, which is usually required during every check-up, a Minisickle is an excellent all round instrument included on the examination tray. But it is also a useful instrument for a scaling set.

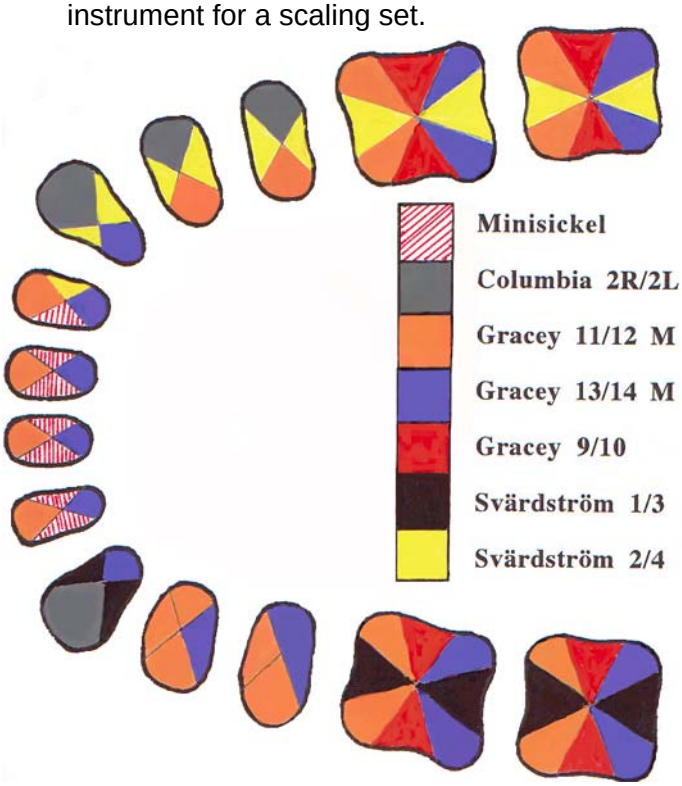

Fig.2 Guide for use of suggested instruments in set

If a dentist or a dental hygienist wants to perform an adequate scaling and root planing on a periodontal patient with tangible pockets and periodontal destructions throughout the dentition, they will need several instruments. Fig. 2 shows the appropriate instruments and their primary applications. Note that incisors and premolars allow for a relatively wide range of variation in the use of different instruments. When working on

convex surfaces buccally, and lingually/palatally in front areas and on premolars, the Gracey 11/12 and 13/14 are usually required. When working on tightly convex surfaces with small arching radii, especially in deeper pockets, the Mini-versions of these instruments are preferable, because the working ends are short, thus making it easier to apply there concave edges against the root surface. Another advantage with the Mini-version is that their shanks are longer than on the standard version, which allows the instrument to be used in deeper pockets. As shown in Fig. 2, these instruments are also used on the mesial-distal 'corners' of molars, which also are tightly convex.

When scaling/planing a concave surface, it is natural to work along the concavity with the working end of the instrument (Fig.3). This results in the vertical application of the working end and the horizontal drawing of the instrument in order to optimize the planing. This is the same principle and orientation one uses to avoid or eliminate a buccal filling excess on a molar, by placing a carver or flared dental drill perpendicularly to the preparation interface and allowing it to follow the contour of the concave buccal surface.

Fig.3 Horizontal draw technique for scaling and root planing of concave proximal surfaces

The Svärdström 1-3 and Svärdström 2-4 proximal curettes are specifically designed for use on interproximal root surfaces, which are usually slightly concave. SV 1-3 is used in quadrant 1 and 3, while 2-4 is used in quadrant 2 and 4 as shown in Fig. 2. Also notice that the illustration in Fig. 2 shows various removal depths for premolars, such as in the upper row (quadrant 4), which have slightly concave proximal surfaces. SV 1-3 and 2-4 are designed to work vertically on the interproximal gaps between teeth, and are thus used distally and mesially in the respective quadrant (fig.4). Differing from standard curettes, such as "corner curettes" Gracey 11-12 and 13-14, the working end of an interproximal curette is comprised of its own shank. Therefore the curette is also made a certain length in order to reach into pockets of a certain depth.

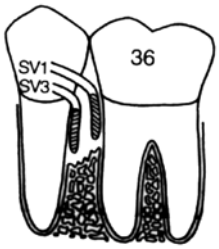

Fig.4 Curette SV 1-3 in the interproximal gap between 35 and 36

For free concave surfaces, such as buccally and lingually on molars, the Gracey 9-10 is an excellent instrument for making similar horizontal drawing movements after applying the working end vertically. The Gracey 9-10 can also be used in diagonal approaches, at axial angles to the lingual/palatal surfaces of premolars and molars. In addition to these instruments, the conventional Columbia 2R/2L curette can also be included in the set. With its slightly wider working end and rounded toe, the Columbia 2R/2L can be very useful in more tangible concavities or incipient furcation involvements. Another advantage to using this instrument is that the working end is moderately angled, thus making its horizontal projection short and allowing for its application in pockets with more tightly convex root surfaces.

It can be generally concluded that instruments can be used in a variety of ways. However, this also requires that the user possesses knowledge of the root morphology and that he or she is adequately trained in the intended use of the instruments. In my view, the seven instruments described above comprise a functional scaling and root planing set that can be used in most situations.