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INSTRUMENT SHARPENING

OBJECT OF SHARPENING

How to evaluate whether the cutting edge is dull and requires sharpening:

- **1. Visual.** The cutting edge should be inspected regularly in a good light and preferably with a magnifying loupe. If the cutting edge is blunt it will be rounded, and as it will be smooth and shiny the light will reflect from it. A dull, non-reflective line indicates sharpness.
- **2. Test Stick.** If the blade of the instrument runs smoothly over the plastic test stick, then it is blunt. A sharp edge bites into the stick and moves with resistance, removing small fragments of the plastic as it does so.

The instrument should ideally be sharpened at the first sign of dullness. If an instrument is allowed to become grossly dulled then more metal has to be removed for re-contouring and this wastes the instrument. Sharpening any instrument eventually reduces the size of the blade, which not only makes it less efficient but also weakens the instrument and it may fracture in clinical use. Manufacturers recommend that the instrument is replaced when the blade has been reduced by 50%.

EQUIPMENT REQUIRED

- A stone, either hand-held or power-driven.
- A firm working surface, this should be a table or bench at which the operator can be seated.
- A good light and a magnifying glass (a x 10 loupe is ideal, but any means of enlarging the view of the cutting edge is helpful).
- A plastic test stick or old toothbrush handle.

The stones for Manual Sharpening may be flat or in the shape of a cone and the technique for using them varies. One of the accepted methods is the moving stone technique, with this method a flat stone is used and the instrument remains grasped in a stationary position. The stone may be of either a natural material such as Arkansas, or of an artificial material such as ceramic. Either of these types of stones may be used for routine sharpening, although the artificial stones tend to be harder and, therefore, more suitable if reshaping of excessively worn instruments is required. The abrasive particles are compressed into a solid piece that is harder than the metal of the instrument.

METHOD

Firstly the stone is lubricated, either with oil in the case of the Arkansas stone or water in the case of an artificial material. Lubrication allows movement of the instrument blade over the stone; also, the metal particles do not clog the stone. The cutting edge of the instrument is examined and tested on the stick to determine the specific areas to be sharpened. The instrument needs to be grasped in the palm grip and the hand rested against the edge of the firm work surface. It is important that the instrument is low enough to allow the clinician to see the cutting edges and the angle formed by the instrument and the stone.

When using the moving stone method, the side of the cutting edge formed by the lateral surface is reduced. For both curettes and sickles the internal angle at the cutting edge is 70°-80°. To preserve this angle, the sharpening stone must be placed and activated carefully. The face of the instrument must be upward and the instrument parallel with the floor.

The stone is applied in a vertical position to the lateral surface. Sharpening is commenced at the heel of the blade. The angle at which the blade is held is then adjusted to maintain the internal 70°-80° angle of the blade. In practice, this means that the stone is angled inwards. This close contact of the stone with the blade is maintained throughout the procedure and the stone is moved vertically in short, rhythmic strokes. Greater pressure is placed on the down stroke. Several strokes are applied to each millimetre of the cutting edge until the toe of the instrument is reached.

The cross-sections of the sickle scaler and the curette are fundamentally different; therefore, the technique of sharpening the toe must vary in order to conserve the basic design of the instrument:-

Sickle Scaler Toe End The sickle scaler has a pointed tip and, therefore, the stone is held straight as it nears the tip.

Curette Toe End The curette has a rounded toe, so the position of the stone is adapted around the rounded cross-section. With both types of instrument, always finish on a down stroke to remove any flash of metal. Finally, evaluate the cutting edge on the testing stick for sharpness. When sharpening the universal curette and the sickle scaler, both sides of the blade need to be sharpened in the manner described above. With the site-specific (Gracey) curette only the downward-sloping lower edge requires to be sharpened, and around the toe.

ELEVATORS & LUXATION INSTRUMENTS

Elevators should be sharpened on the convex surface using a flat stone. The object is to maintain the 'chisel angle' (this varies depending on the instrument design) and create sharp corners. In use the sharp corners grip the root surface and rotate the tooth in the socket severing the periodontal ligaments and exerting a lifting (elevating) motion on the tooth.

Luxation instruments should be sharpened on the concave surface with a conical stone so that the section of stone used matches the diameter of the instrument.

CARE OF THE SHARPENING STONE

After use the stone should be wiped with gauze and alcohol to remove the particles of metal. If oil has been used on the stone then it must be removed before sterilisation. The stone may be placed in an ultrasonic cleaning bath or scrubbed with soap and hot water to remove the oil. It should then be placed in the autoclave. If a sterile sharpening stone is available as part of the instrument set-up then instruments can be sharpened during a scaling procedure.



Diamond Card



Ceramic Wedge Shaped Stone



Diamond Conical File