Periodontology- fourth stage

First semester-periodontal instrument and sharping
Lec-9-Part I

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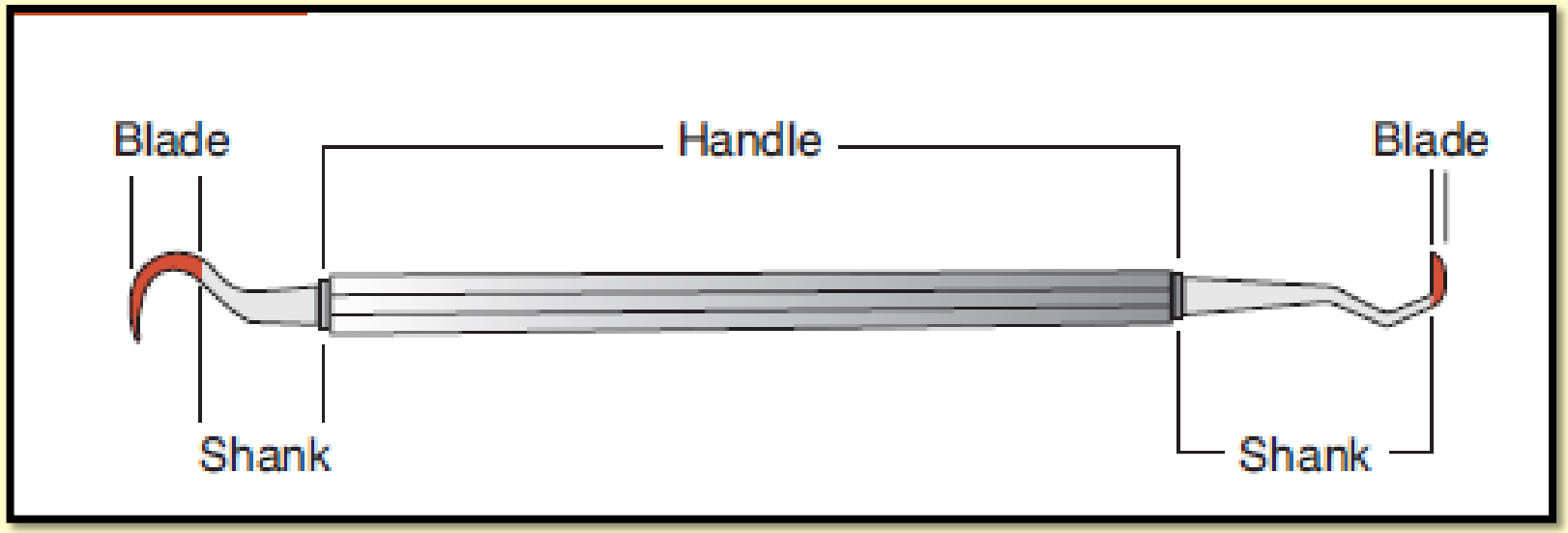
Instruments

- Periodontal instrument is composed of:

Blade
Shank
Handle



Parts of typical periodontal instrument

Classification of Periodontal Instruments

✓ **Periodontal instruments are classified according to the purposes they serve, as follows:**

1. **Periodontal probes** are used to locate, measure, and mark pockets, as well as determine their course on individual tooth surfaces.

2. **Explorers** are used to locate calculus deposits and caries.

3. **Scaling, root-planing, and curettage instruments** are , used for **removal of biofilm and calcified deposits** from the crown and root of a tooth, **removal of altered cementum** from the subgingival root surface, and **debridement of the soft tissue lining the pocket.**

Scaling and curettage instruments are classified as follows:

- **Sickle scalers** are heavy instruments used to remove supragingival calculus.
- **Curettes** are fine instruments used for subgingival scaling, root planing, and removal of the soft tissue lining the pocket.

• **Hoe, chisel, and file scalers** are used to remove tenacious subgingival calculus and altered cementum. Their use is limited compared with that of curettes.

• **Implant instruments** are plastic or titanium scalers and curettes designed for use on implants and implant restorations.

• **Ultrasonic and sonic instruments** are used for scaling and cleansing tooth surfaces and curetting the soft tissue wall of the periodontal pocket.

4. Periodontal endoscopes are used for deep visualization into subgingival pockets and furcations, thereby allowing the detection of deposits.

5. Cleansing and polishing instruments, such as rubber cups, brushes, and dental tape, are used to clean and polish tooth surfaces.

1. ***Periodontal probes*** are used to locate, measure, and mark pockets, as well as determine their course on individual tooth surfaces.

- ✓ When measuring a pocket, the probe is inserted with firm, gentle pressure to the bottom of the pocket. The shank should be aligned with the long axis of the tooth surface to be probed.

Furcation areas can best be evaluated with the curved, blunt Nabers probe

Types of periodontal probes

- **Michigan “O” probe with markings at 3, 6, and 8 mm.**

Marking are at 3,6 and 8

- **The UNC-15 Probe**

15 mm long

Marking at each mm and **color coding** at the 5th,10th and15th

- **Marquis color-coded probe**

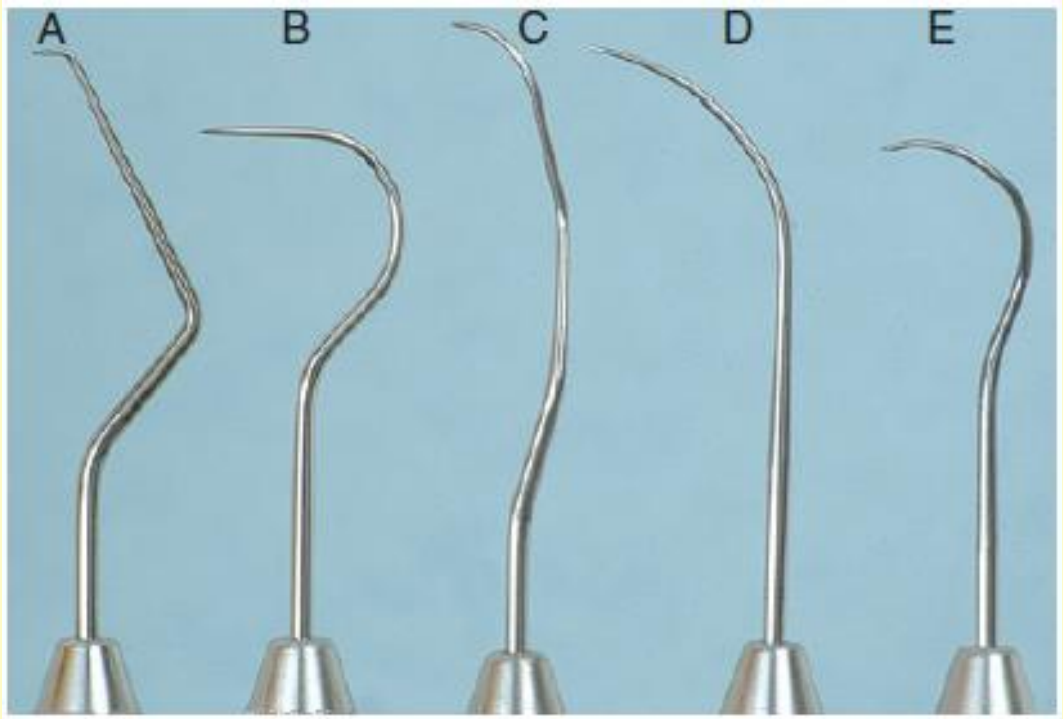
Calibration are in 3mm section
Marking at 3,6,9,12

- **University of Michigan “O” probe, with Williams markings (at 1, 2, 3, 5, 7, 8, 9, and 10 mm).**

- **World Health Organization probe (WHO)**

2. *Explorers*

- Explorers are used to locate calculus deposits and caries.

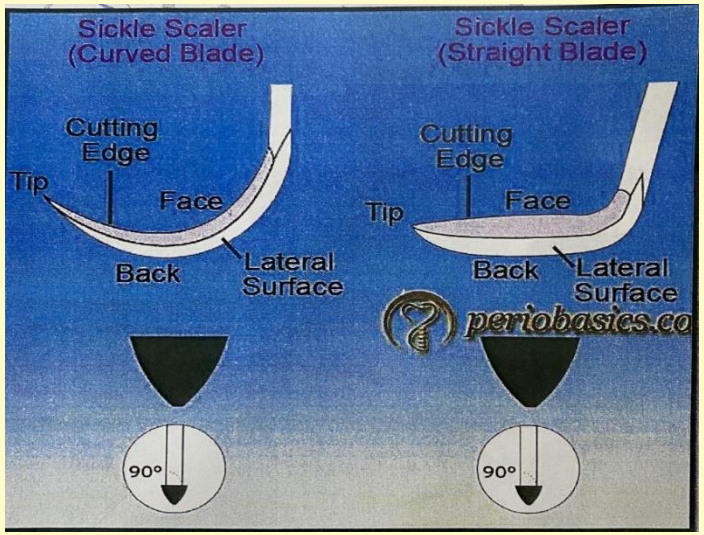


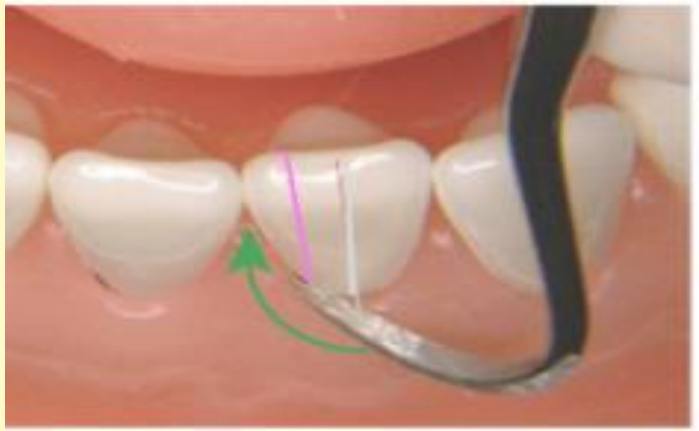
3. *Scaling, root-planing, and curettage instruments*

A. Sickle scaler

- ✓ Sickle scalers have a flat surface and two cutting edges that converge in a sharply pointed tip.
- ✓ used primarily to remove supragingival calculus.
- ✓ Sickle scalers are used with a pull stroke.

- **Sickle scalers with straight shanks are designed for use on anterior teeth and premolars.**
- **Sickle scalers with contra-angled shanks adapt to posterior teeth.**





B. Curette

- ✓ The curette is the instrument of choice for removing deep subgingival calculus, root planing altered cementum, and removing the soft tissue lining the periodontal pocket.

- ✓ Each working end has a cutting edge on both sides of the blade and a rounded toe

Two types:

- **Universal Curettes**
- **Area specific curettes.**

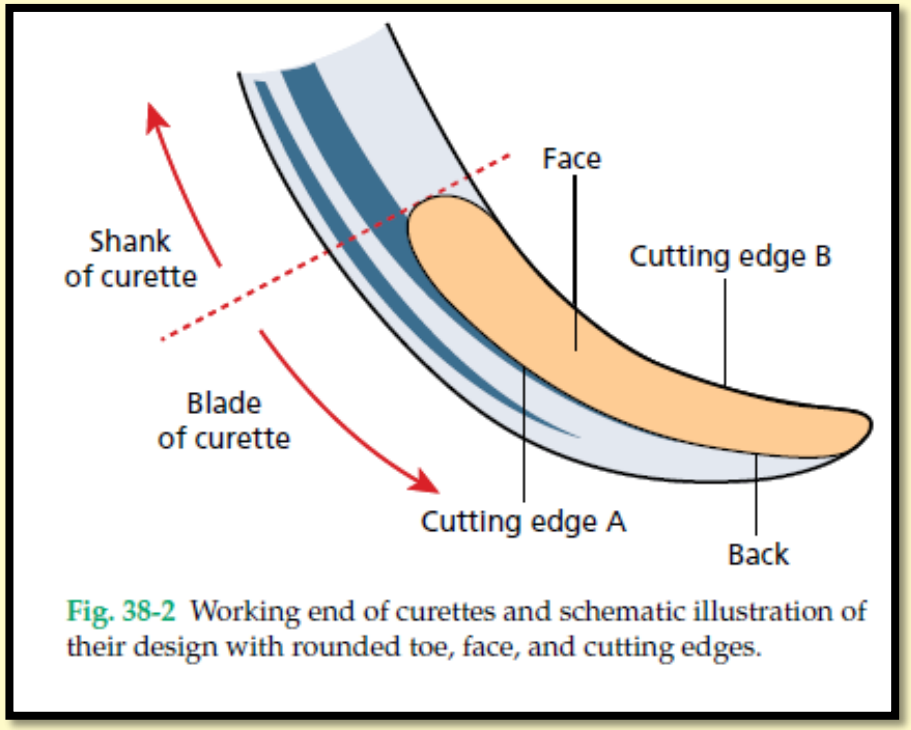


Fig. 38-2 Working end of curettes and schematic illustration of their design with rounded toe, face, and cutting edges.

❖ Universal Curettes

- Universal curettes have cutting edges that may be inserted in most areas of the dentition by altering and adapting the finger rest, fulcrum, and hand position of the operator.

Universal Curettes

❖ Gracey Curettes

➢ Gracey curettes are representative of the area-specific curettes, a set of several instruments designed and angled to adapt to specific anatomic areas of the dentition.

- **Gracey #1-2 and #3-4**: Anterior teeth.
- **Gracey #5-6**: Anterior teeth and premolars.
- **Gracey #7-8 and #9-10**: Posterior teeth, facial and lingual.
- **Gracey #11-12**: Posterior teeth, mesial.
- **Gracey #13-14**: Posterior teeth, distal.

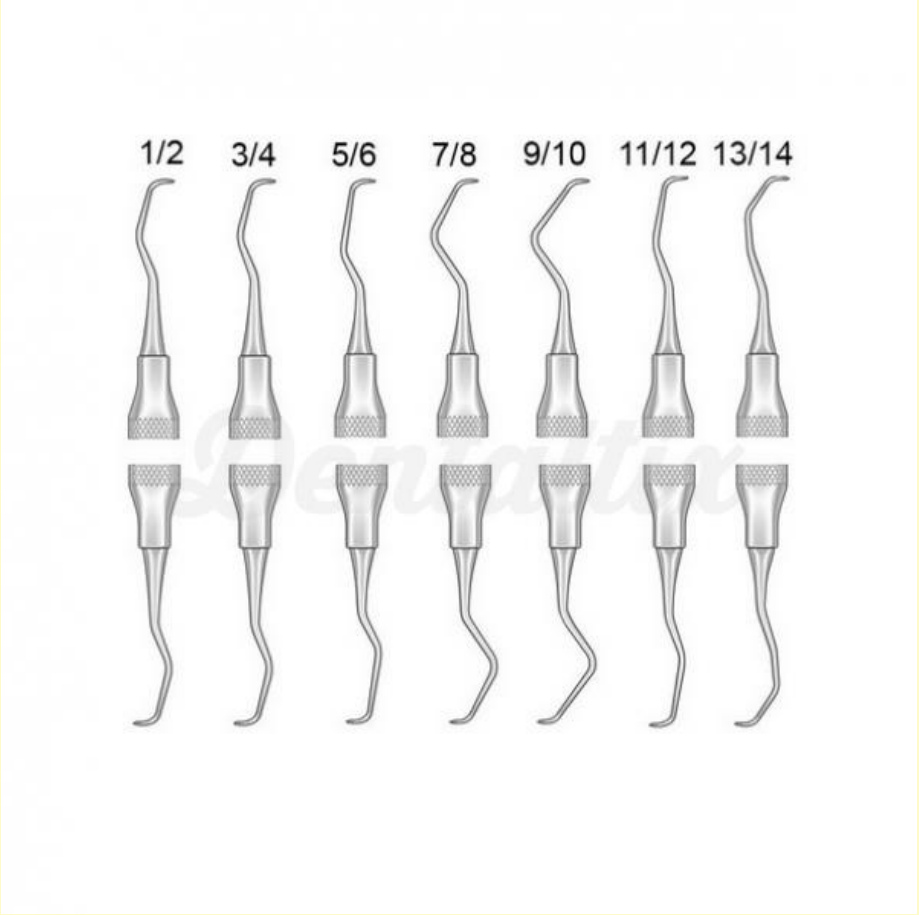
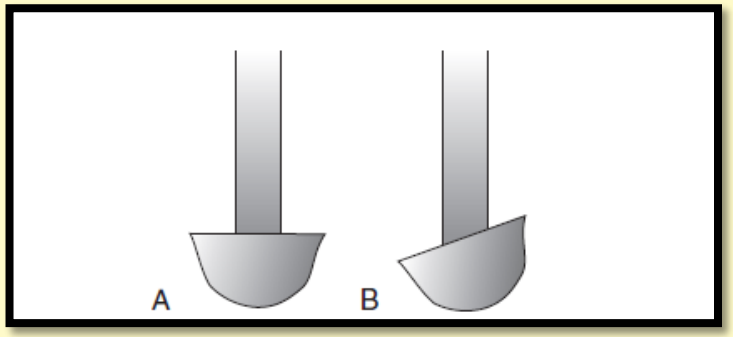
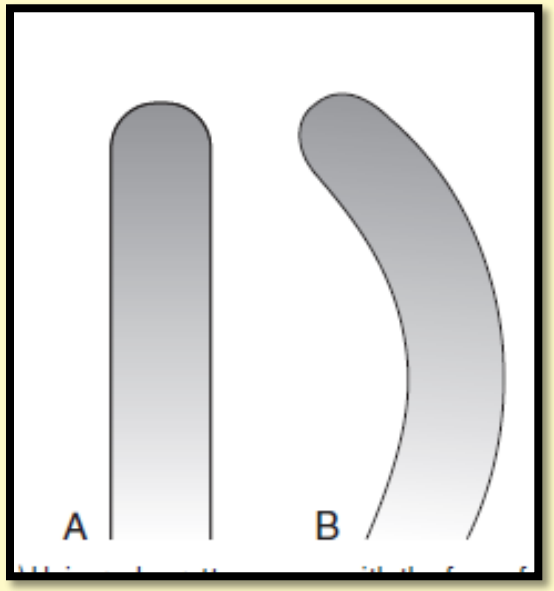


TABLE : Comparison of Area-Specific (Gracey) and Universal Curettes

	Gracey Curette	Universal Curette
Area of use	Set of many curettes designed for specific areas and surfaces	One curette designed for all areas and surfaces
Cutting Edge		
Use	One cutting edge used; work with outer edge only	Both cutting edges used; work with either outer or inner edge
Curvature	Blade curves from the shank toward the toe and also appears to curve to the side	Blade curves only from the shank toward the toe, not to the side
Blade angle	Offset blade; face of blade beveled at 60 degrees to shank	Blade not offset; face of blade beveled at 90 degrees to shank



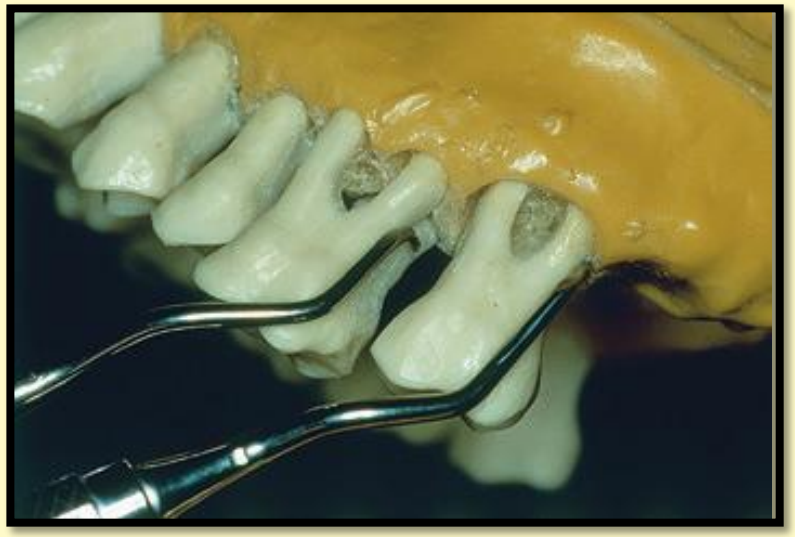
Note the offset blade angulation of the Gracey curette



Other types

❑ Extended-Shank Curettes

Such as After Five curettes , are modifications of the standard Gracey curette design. **The terminal shank is 3 mm longer**, allowing extension into deeper periodontal pockets of 5 mm or more.

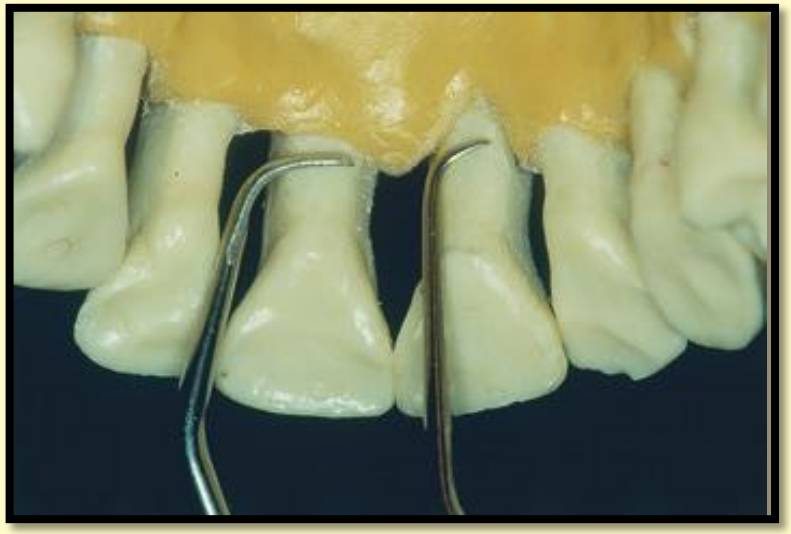


Comparison of After Five curette with standard Gracey curette. Rigid Gracey #13-14 adapted to the distal surface of the first molar and rigid After Five #13-14 adapted to the distal surface of the second molar. Notice the extra long shank of the After Five curette, which allows deeper insertion and better access.

❑ Mini-Bladed Curettes.

- Mini-bladed curettes, such as Hu-Friedy Mini Five curettes, are modifications of the After Five curettes.

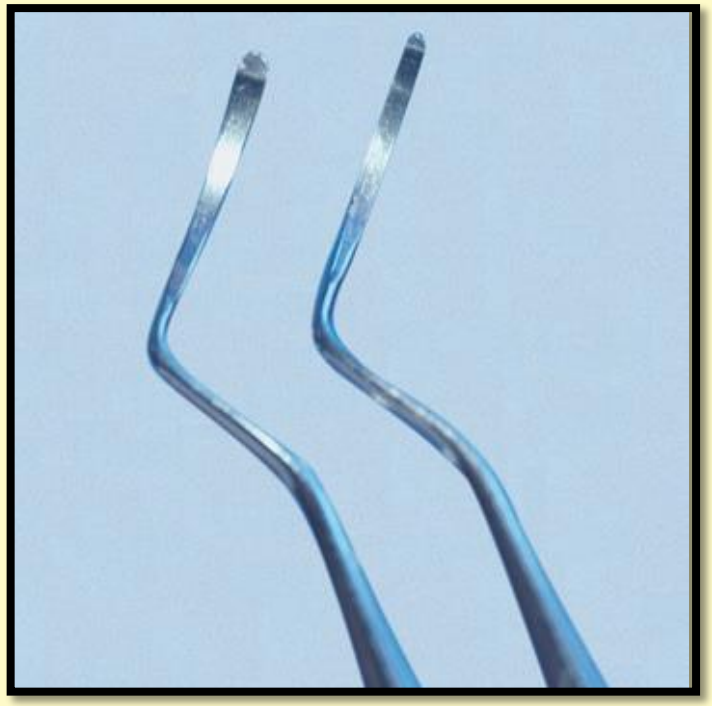
- The shorter blade allows **easier insertion and adaptation** in deep, narrow pockets; furcations; developmental grooves; line angles; and deep, tight facial, lingual, or palatal pockets



Comparison of standard rigid Gracey #5-6 with rigid Mini Five #5-6 on the palatal surfaces of the maxillary central incisors.

❑ Quétin Furcation Curettes

- These instruments remove burnished calculus from recessed areas of the furcation where curettes, even mini-bladed curettes, are often too large to gain access.



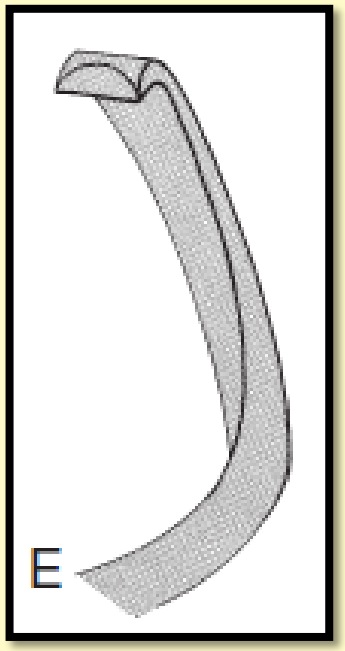
Quétin furcation curettes: BL2 (larger) and BL1 (smaller)

❑ Schwartz Periotrievers

Schwartz Periotrievers comprise a set of two double-ended, highly magnetized instruments designed for retrieval of a broken instrument.

Broken instrument tip attached to the magnetic tip of a Schwartz Periotriever

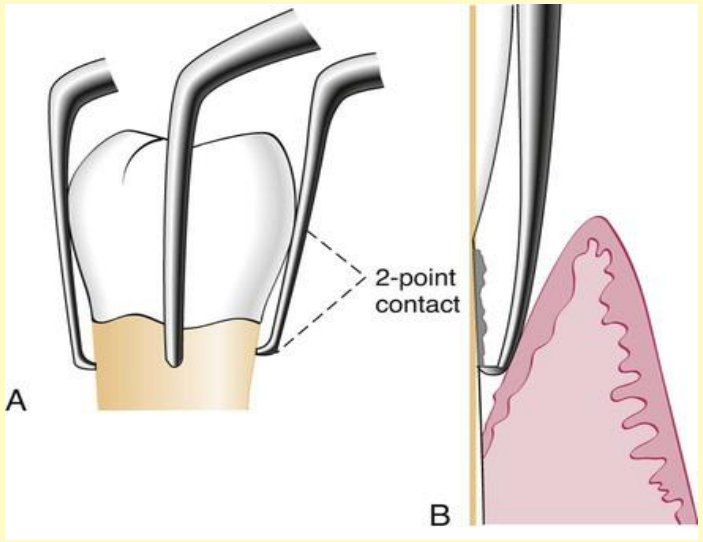
C. Hoe scaler



- ✓ Hoe scalers are used for scaling of ledges or rings of calculus.

❑ Hoe scalers are used in the following manner:

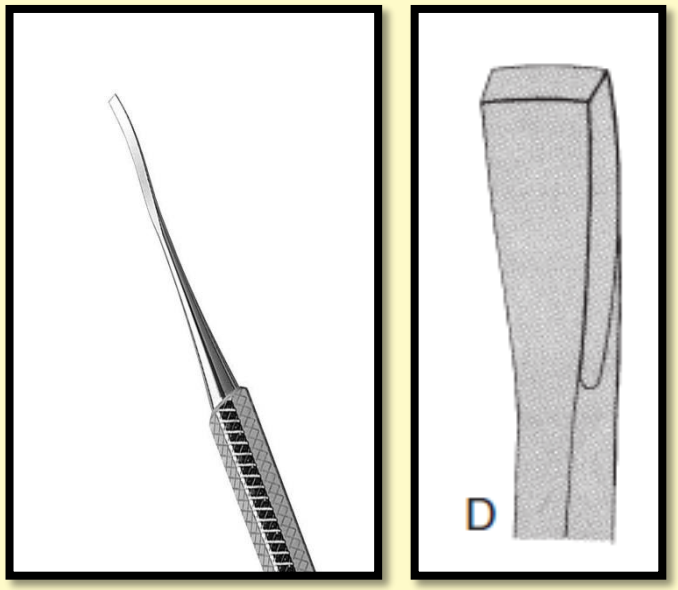
- ✓ The blade is inserted into the base of the periodontal pocket so that it makes two-point contact with the tooth.
- ✓ Activation with a firm pull stroke while preserving the two point contact with the tooth.



D. Chisel scaler

- The chisel scaler, designed for the proximal surfaces of teeth too closely spaced to permit the use of other scalers, is usually used in the anterior part of the mouth.

- The chisel is inserted from the facial surface. The instrument is activated with a push motion while the side of the blade is held firmly against the root.



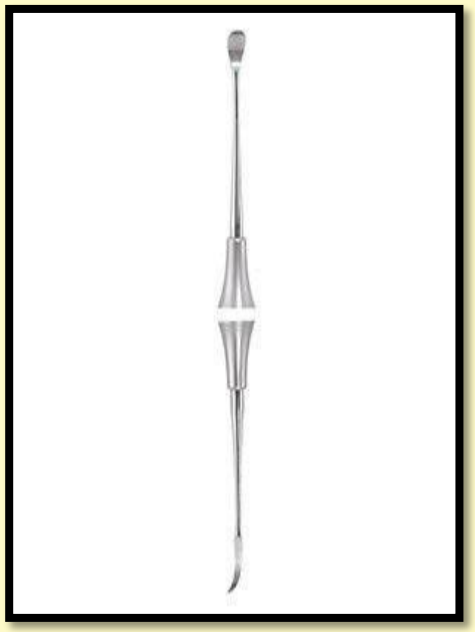
Chisel Scaler

E. Files

✓ Their primary function is to fracture or crush large deposits of tenacious calculus or burnished sheets of calculus.

F.Cumine

- A hybrid double ended instrument
- One end is a spoon curette
- The other is a heavy duty tooth scaler



➢ Uses

Both ends can be used to dislodge thick calculus deposit to allow visualization of the crown or prior to further scaling.

✓ **Scaler end**; to remove heavy supragingival calculus deposits

✓ **Curette end**; gentle curettage of the large sockets to remove the granulation tissue(if present) removal of the soft tissue from site of bony pathology.

G. Plastic and Titanium Instruments for Implants

- Several companies are manufacturing plastic and titanium instruments for use on titanium and other implant abutment materials. It is important that plastic or titanium instruments be used to avoid scarring and permanent damage to implants.

New Mini titanium implant scalers

Mini-bladed titanium implant curettes

Micro Mini titanium implant curettes

H. Ultrasonic and Sonic Instruments

- Power instruments are useful tools that can be used alone or in combination with hand instruments.
- Evidence indicates that power and hand instruments have similar clinical outcomes.

Advantage of ultrasonic over hand Instrument:

1- Less effort, pressure, trauma and time.

2- Simple manipulation.

3- Water sprays clean debris.

Disadvantage of sonic & ultrasonic instrumentations:

1- Lack of tactile sensation because of light pressure during manipulation.

2- Heat generation, required coolant system.

3- Impair of visibility because of water spray.

4- Aerosol contamination.

5-noise.

Precautions for Use of Mechanized Instruments

- Unshielded pacemakers
- Infectious diseases: human immunodeficiency virus, hepatitis, tuberculosis (active stages)
- Demineralized tooth surface
- Exposed dentin (especially associated with sensitivity)
- Restorative materials (porcelain, amalgam, gold, composite)
- Titanium implant abutments unless using special insert
- Children (primary teeth)
- Immunosuppression from disease or chemotherapy
- Uncontrolled diabetes mellitus

Ultrasonic and sonic scalers

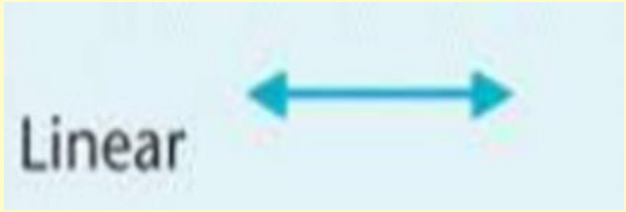
- Power scalers such as sonic scalers, magnetostrictive, and piezo scalers are mainstays of clinical practice. They are efficient tools for both deplaquing and calculus removal

Two types of ultrasonic units are magnetostrictive and piezoelectric.

- **Magnetostrictive ultrasonic devices and Piezoelectric ultrasonic units** works in a frequency range of 18,000 to 50,000 cycles per second.

Magnetostrictive ultrasonic devices: Tips move in an elliptical pattern. This allows the tip four active working surfaces.

Piezoelectric ultrasonic units: Piezoelectric tips move in a linear pattern, giving the tip two active surfaces.



***Sonic* units** work at a frequency of 2000 to 6500 cycles per second

❑ Special Considerations

Power-driven instruments must be used with some caution. Roots may be rougher post scaling than with hand instruments. Due to aerosol production, proper infection control procedures need to be implemented. Power-driven instruments may be contraindicated for people with pacemakers.

✓ Aerosol Production

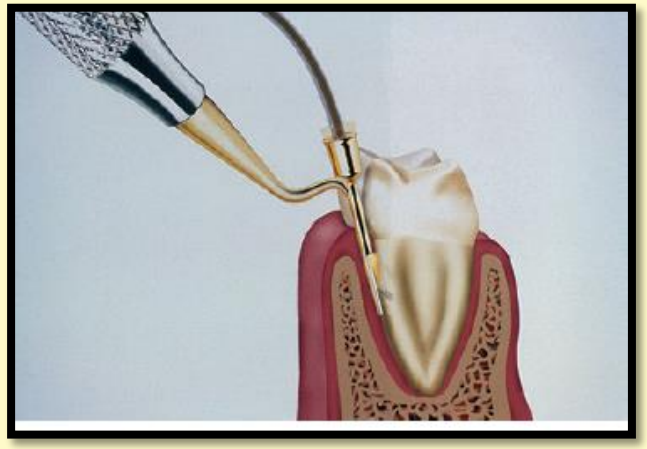
- Power-driven devices produce bioaerosols and splatter, which can contaminate the operator and remain in the air for up to 30 minutes. Good infection control practices can minimize the hazard.

- A face shield may be required. To help minimize bioaerosols, preprocedural rinsing and high-speed evacuation have been shown to be effective.

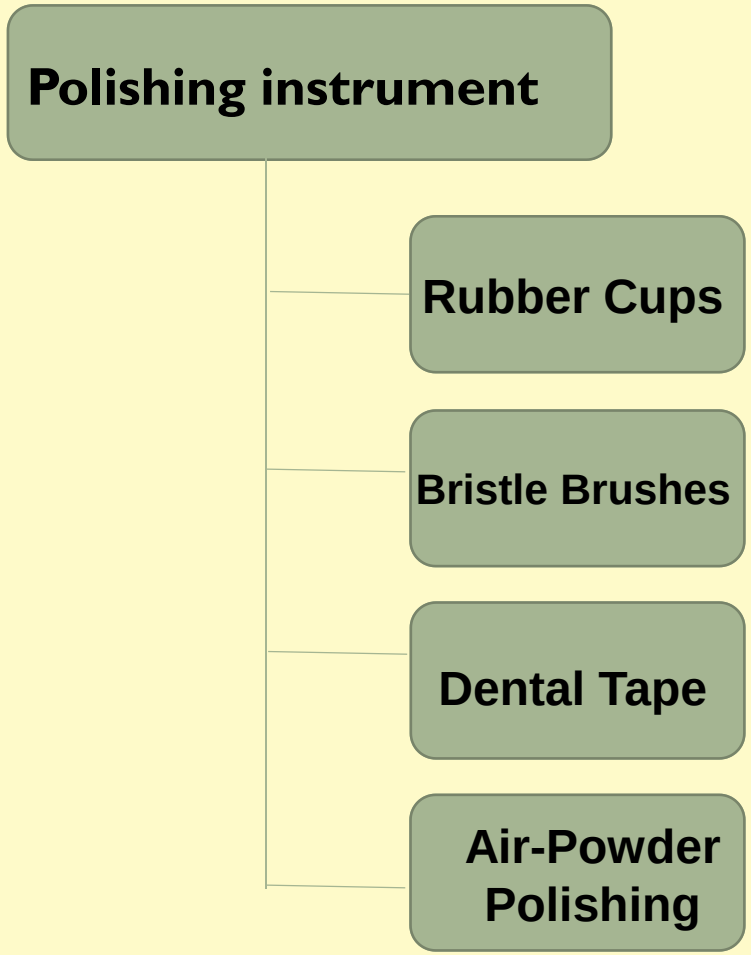
4. Dental Endoscope

- ***Periodontal endoscopes*** are used for deep visualization into subgingival pockets and furcations, thereby allowing the detection of deposits.

✓ The Perioscopy system can also be used to evaluate subgingival areas for caries, defective restorations, root fractures, and resorption.



Polishing instruments



5.Cleansing and Polishing Instruments

Rubber Cups

- ✓ They are used in the handpiece with a special prophylaxis angle.
- ✓ A good cleansing and polishing paste that contains fluoride should be used and kept moist to minimize frictional heat as the cup revolves.

Bristle Brushes

Bristle brushes are available in wheel and cup shapes. The brush is used in the prophylaxis angle with a polishing paste.

Cavitron prophy jet air-powder polishing device

Dental Tape

✓ Dental tape with polishing paste is used for polishing proximal surfaces that are inaccessible to other polishing instruments.

Air-Powder Polishing

✓ Air-powered device is used with specially designed handpiece

✓ This device is called **Prophy-Jet**. It deliver an air-powered slurry of warm water and sodium bicarbonate for polishing.

✓ Is very effective for removing extrinsic stains and soft deposits.

❖ Polishing powders containing glycine or erythritol rather than sodium bicarbonate are commonly used in Europe for subgingival biofilm removal from root surfaces.

Periodontal surgical instrument

These are Classified as:

1. Exisional and incisional instrument.

2. Surgical curettes and sickle.

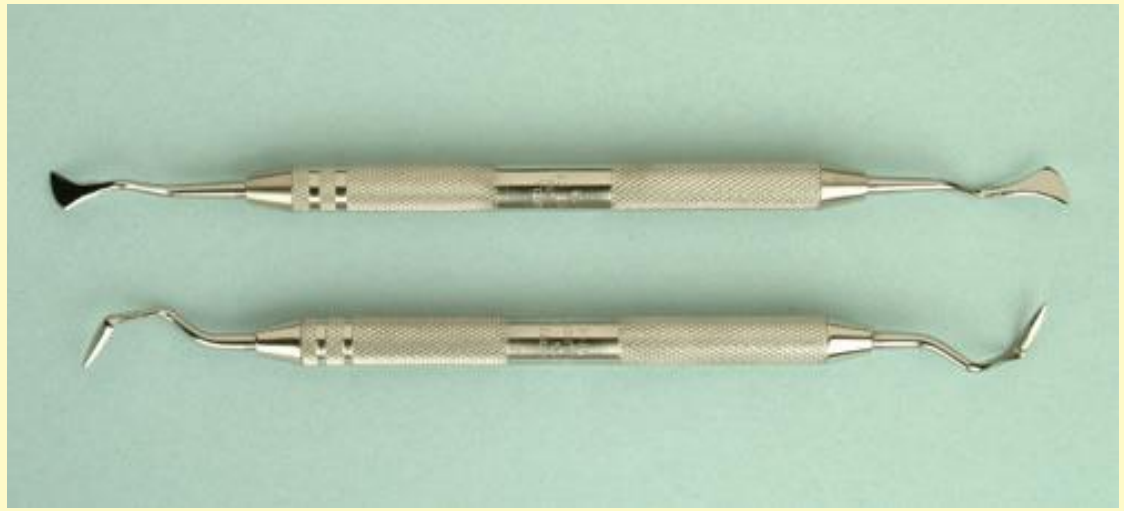
3. Periosteal elevator

4. Surgical chisel.

5. Surgical files.

6. Scissors.

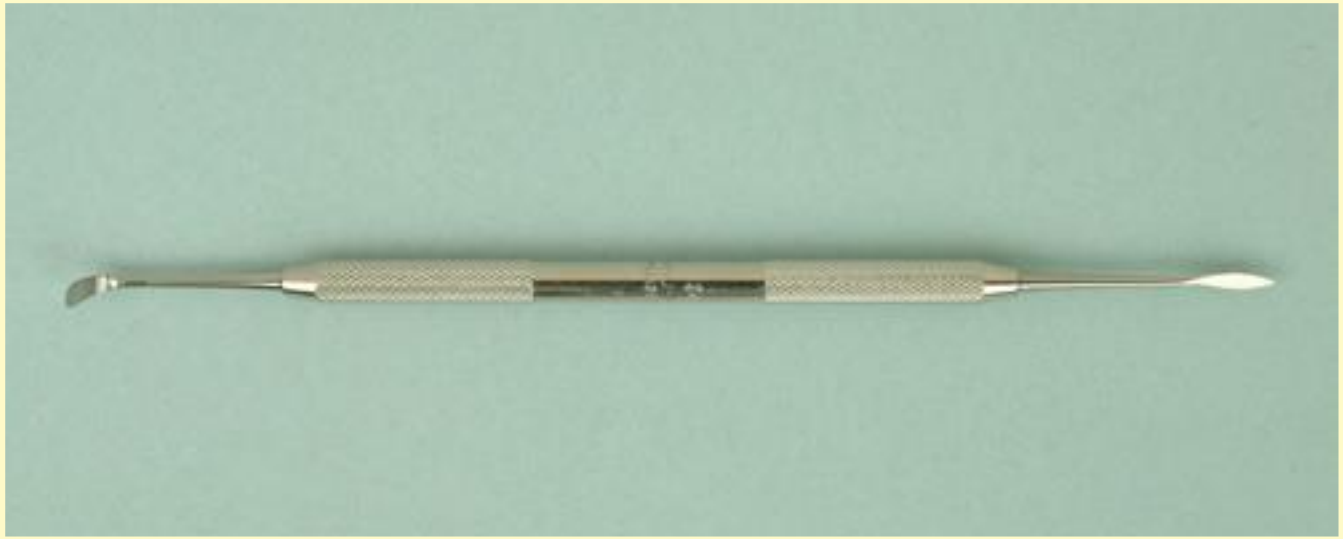
7. Needle holder.



Orban and krikland knife

Scalpel and blades

Curatte



Periosteal elevator

Needle holder

scissor

Sickle

Bibliography

- *Newman and Carranza's Clinical Periodontology, THIRTEENTH EDITION.*


Thank
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