

Principles of Exodontia

For most people, dentists, and laypeople alike, the term *oral surgery* usually implies the removal of a tooth. The atraumatic extraction of a tooth is a procedure that requires finesse, knowledge, and skill on the part of the surgeon. The purpose of this section is to present the principles of exodontia, as well as the instrumentation, techniques, and management of patients who are undergoing extraction surgery.

Chapter 6 presents the armamentarium commonly used for office oral surgical procedures. The basic instrumentation and their fundamental applications to their surgical purposes are discussed. Many variations of the instruments presented here are available.

Chapter 7 presents the basic aspects of how to remove an erupted tooth atraumatically. The preoperative assessment and preparation of the patient are briefly discussed. The position of the patient in the chair and the position of the surgeon, the surgeon's hands, and the dental assistant for the removal of each tooth are discussed. The armamentarium and movements necessary to extract each tooth are discussed in detail.

Chapter 8 presents the basic aspects of managing complicated extractions. Complicated extractions primarily refer to retrieving tooth roots and teeth that are likely to fracture or, for some other reason, have an obstacle to extraction. In these situations, surgical removal of bone or surgical sectioning of the tooth is required.

Chapter 9 presents the fundamental aspects of management of impacted teeth. The rationale for timely removal of impacted teeth is presented in the initial portion of the chapter. Classifying and determining the degree of difficulty of the impaction follow. Last, a brief description of the basic surgical techniques required to remove impacted third molars is provided.

Chapter 10 presents the techniques for managing the patient during the postoperative period. This chapter discusses postoperative instructions that should be given to the patient, as well as postoperative medications.

Chapter 11 presents the common surgical complications that are encountered in the removal of teeth. Emphasis is placed on anticipating complications and taking measures to prevent or minimize them.

Last, Chapter 12 discusses the medical and legal considerations involved in basic exodontia. An important portion of this chapter discusses the concept .of informed consent for the patient.

Armamentarium for Basic Oral Surgery

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CHAPTER

CHAPTER OUTLINE

INSTRUMENTS FOR INCISING TISSUE
INSTRUMENTS FOR ELEVATING MUCOPERIOSTEUM
INSTRUMENTS FOR RETRACTING SOFT TISSUE
INSTRUMENTS FOR CONTROLLING HEMORRHAGE
INSTRUMENTS FOR GRASPING TISSUE
INSTRUMENTS FOR REMOVING BONE
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- Chisel and Mallet
- Bone File
- Bur and Handpiece

INSTRUMENTS FOR REMOVING SOFT TISSUE FROM BONY DEFECTS
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- Needle
- Suture Material
- Scissors

INSTRUMENTS FOR HOLDING MOUTH OPEN
INSTRUMENTS FOR PROVIDING SUCTION
INSTRUMENTS FOR TRANSFERRING STERILE INSTRUMENTS
INSTRUMENTS FOR HOLDING TOWELS AND DRAPES IN POSITION
INSTRUMENTS FOR IRRIGATION
DENTAL ELEVATORS
- Components
- Types

EXTRACTION FORCEPS
- Components
- Maxillary Forceps
- Mandibular Forceps

INSTRUMENT TRAY SYSTEMS

The purpose of this chapter is to introduce the instrumentation required to perform routine oral surgical procedures. These instruments are used for a wide variety of purposes, including both soft tissue and hard tissue procedures. This chapter deals primarily with a description of the instruments; subsequent chapters discuss the actual use of the instruments in the variety of ways for which they are intended.

INSTRUMENTS FOR INCISING TISSUE

Most surgical procedures begin with an incision. The instrument for making an incision is the scalpel, which is composed of a handle and a disposable, sterile sharp blade. The most commonly used handle is the no. 3 handle, but occasionally the longer, more slender no. 7 handle will be used (Fig. 6-1). The tip of the scalpel handle is prepared to receive a variety of differently shaped scalpel blades that can be inserted onto a slotted receiver.

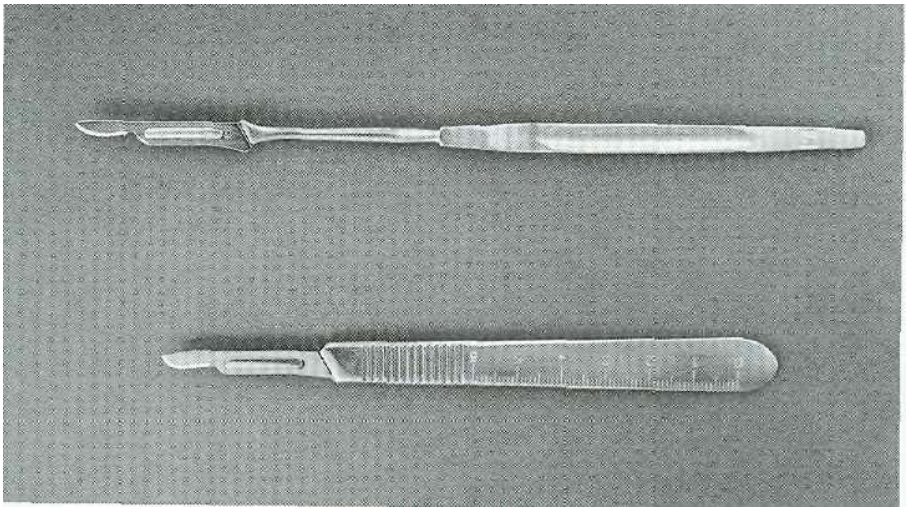


FIG. 6-1 Scalpels are composed of handle and sharp, disposable blade. Scalpel no. 7 handle with no. 15 blade *(top)* and scalpel with more commonly used no. 3 handle *(bottom).*

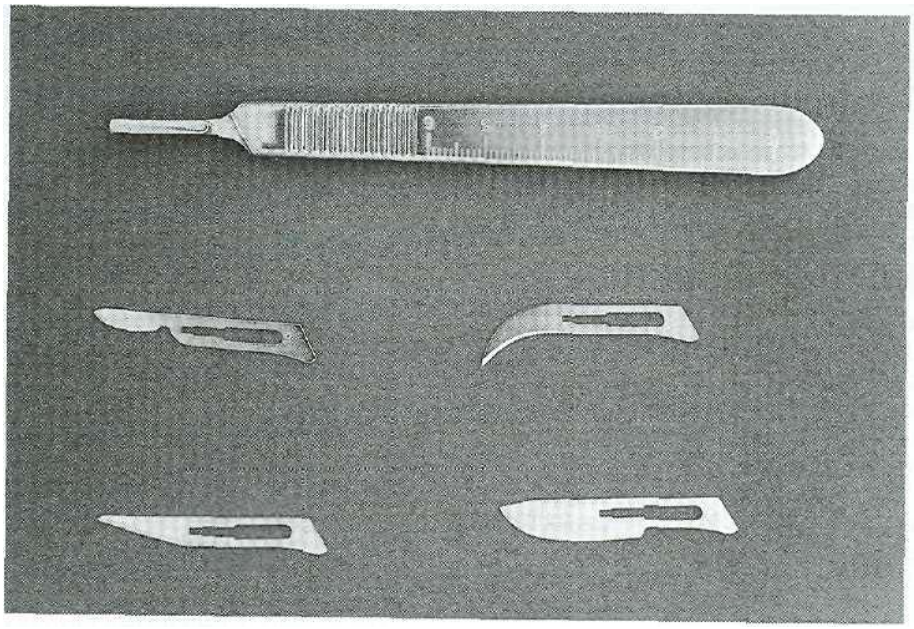


FIG. 6-2 Scalpel blades used in oral surgery include no. 15 *(middle left),* no. 12 *(middle right),* no. 11 *(lower left),* and no. 10 *(lower right).* No. 3 scalpel handle is above.

The most commonly used scalpel blade for intraoral surgery is the no. 15 blade (Fig. 6-2). It is relatively small and can be used to make incisions around teeth and through mucoperiosteum. It is similar in shape to the larger no. 10 blade, which is used for large skin incisions. Other commonly used blades for intraoral surgery are the no. 11 blade and the no. 12 blade. The no. 11 blade is a sharp-pointed blade that is used primarily for making small stab incisions, such as for incising an abscess. The hooked no. 12 blade is useful for mucogingival procedures in which incisions must be made on the posterior aspect of teeth or in the maxillary tuberosity area.

The scalpel blade is carefully loaded onto the handle with a needle holder to avoid lacerating the operator's fingers. The blade is held on the superior edge, where it is reinforced with a small rib, and the handle is held so that the male portion of the fitting is pointing upward (Fig. 6-3, *A),* The knife blade is then slid onto the handle until it clicks into position (Fig. 6-3, *B).* The knife is unloaded in a similar fashion. The needle holder grasps the most proxi-

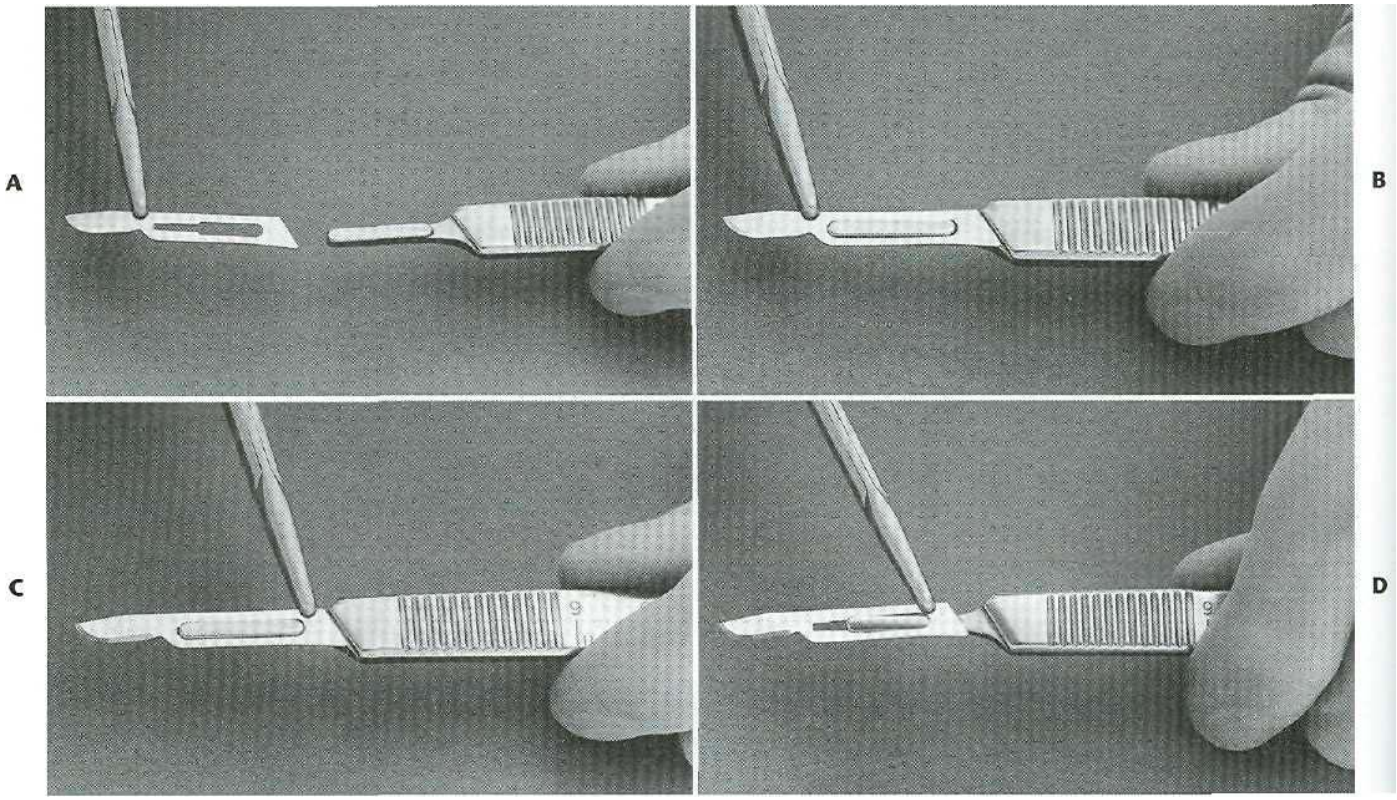


FIG. 6-3 A, When loading scalpel blade, surgeon holds blade in needle holder and handle, with male portion of fitting pointing upward. B, Blade is then slid into handle until it clicks into place. C, To remove blade, the surgeon uses needle holder to grasp proximal end of blade and lifts it to disengage it from fitting. D, Blade is then slid off handle.

mal end of the blade (Fig. 6-3, C) and lifts it to disengage it from the male fitting. It is then slid off the knife handle in the opposite direction (Fig. 6-3, D). The used blade is discarded into a proper rigid-sided "sharps" container.

When using the scalpel to make an incision, the surgeon holds it in the pen grasp (Fig. 6-4) to allow maximal control of the blade as the incision is made. Mobile tissue should be held firmly to stabilize it so that as the incision is made, the blade will incise, not displace, the mucosa. When a mucoperiosteal incision is made, the knife should be pressed down firmly so that the incision penetrates the mucosa and periosteum with the same stroke.

Scalpel blades are designed for single-patient use. They are dulled very easily when they come into contact with hard tissue such as bone and teeth. If several incisions through mucoperiosteum to bone are required, it may be necessary to use a second blade during a single operation. It is important to remember that dull blades do not make clean, sharp incisions in soft tissue and therefore should be replaced when they become dull.

INSTRUMENTS FOR ELEVATING MUCOPERIOSTEUM

After an incision through mucoperiosteum has been made, the mucosa and periosteum should be reflected from the underlying bone in a single layer with a periosteal elevator. The instrument that is most commonly used is the no. 9 Molt periosteal elevator (Fig. 6-5, *A).* This instrument has a sharp, pointed end and a broader fiat end. The pointed end is used to reflect dental papillae from between teeth, and the broad end is used for elevating the tissue from the bone.

Some surgeons prefer to use round-ended Molt periosteal elevators. This type of periosteal elevator can be single-ended (Fig. 6-5, *B)* or double-ended (Fig. 6-5, C and *D).* The cutting edge of the Molt periosteal elevator is thin and sharp, resulting in a clean separation of the periosteum from the bone.

The periosteal elevator can be used to reflect soft tissue by three methods: First, the pointed end can be used in a prying motion to elevate soft tissue. This is most commonly used when elevating a dental papilla from between teeth. The second method is the push stroke, in which the broad end of the instrument is slid underneath the flap, separating the periosteum from the underlying bone. This is the most efficient stroke and results in the cleanest reflection of the periosteum. The third method is a pull, or scrape, stroke. This is occasionally useful in some areas but tends to shred or tear the periosteum unless it is done carefully.

The periosteal elevator can also be used as a retractor. Once the periosteum has been elevated, the broad blade of the periosteal elevator is pressed against the bone, with the mucoperiosteal flap elevated into its reflected position.

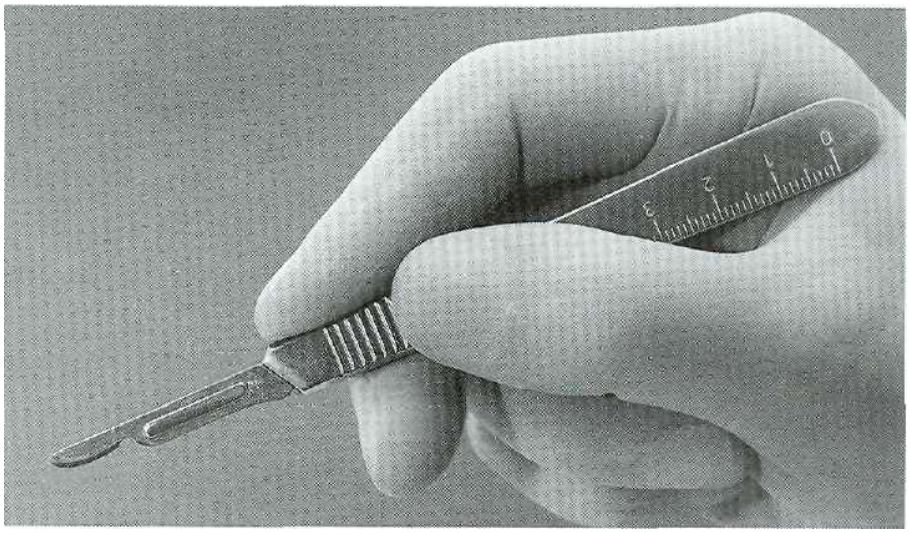


FIG. 6-4 Scalpel is held in pen grasp to allow maximal control.

When teeth are to be extracted, the soft tissue attachment around the tooth must be released from the tooth. The instrument most commonly used for this is the no. 1 Woodson periosteal elevator (Fig. *6-6)*. This instrument is relatively small and delicate and can be used to loosen the soft tissue via the gingival sulcus. The pointed end of the no. 9 periosteal elevator can also be used for this purpose.

INSTRUMENTS FOR RETRACTING SOFT TISSUE

It is critical to have good vision and good access to perform good surgery. To this end, a variety of retractors have been designed to retract the cheeks, tongue, and mucoperiosteal flaps.

The two most popular cheek retractors are (1) the right-angle Austin retractor (Fig. 6-7) and (2) the offset broad Minnesota retractor (Fig. 6-8). Both of these retractors can retract the cheek and a mucoperiosteal flap simultaneously. Before the flap is created, the retractor is held loosely in the cheek, and once the flap is reflected the retractor is placed on the bone and is then used to retract the flap.

In addition to the Austin and Minnesota retractors, other retractors are designed more specifically to reflect soft tissue flaps. The Seldin retractor is typical of this kind (Fig. 6-9). Although this retractor may look similar to a periosteal elevator, the leading edge is not sharp but rather is dull and should not be used to reflect mucoperiosteum. The periostea! elevator is often used as the primary instrument to retract soft tissue. Once the flap has been reflected, the periosteal elevator is positioned on bone and held there to reflect the tissue.

The instrument most commonly used to retract the tongue is the mouth mirror. This is usually part of every basic setup, because it has both the usual use and use as a tongue retractor. The Weider tongue retractor is a broad, heart-shaped retractor that is serrated on one side so that it can more firmly engage the tongue and retract it medially and anteriorly (Fig. 6-10). When this retractor is used, care must be taken not to position it so far posteriorly that it causes gagging (Fig. 6-11).

The towel clip can be used to hold the tongue. When a biopsy procedure is to be performed on the posterior aspect of the tongue, the most positive way to control the tongue is by holding the anterior tongue with a towel clip. Local anesthesia must be profound where the clip is placed.

INSTRUMENTS FOR CONTROLLING HEMORRHAGE

When incisions are made through tissue, small arteries and veins are incised, causing bleeding that may require more than simple pressure to control. When this is necessary, an instrument called a *hemostat* is used (Fig. 6-12, *A)*. Hemostats come in a variety of shapes, may be relatively small and delicate or larger, and are either straight or curved. The hemostat most commonly used in oral surgery is a curved hemostat (Fig. 6-12, *B)*.

The hemostat has a relatively long, delicate beak, used to grasp tissue, and a locking handle. The locking mechanism allows the surgeon to clamp the hemostat onto a vessel and then let go of the instrument, which will remain clamped onto the tissue.

In addition to its use as an instrument for controlling bleeding, the hemostat is especially useful in oral surgery to remove granulation tissue from tooth sockets and to pick up small root tips, pieces of calculus, fragments of amalgam restorations, and any other small particles that have dropped into the mouth or wound area.

INSTRUMENTS FOR GRASPING TISSUE

In performing soft tissue surgery it is frequently necessary to stabilize soft tissue flaps to pass a suture needle. Tissue forceps most commonly used for this purpose are the

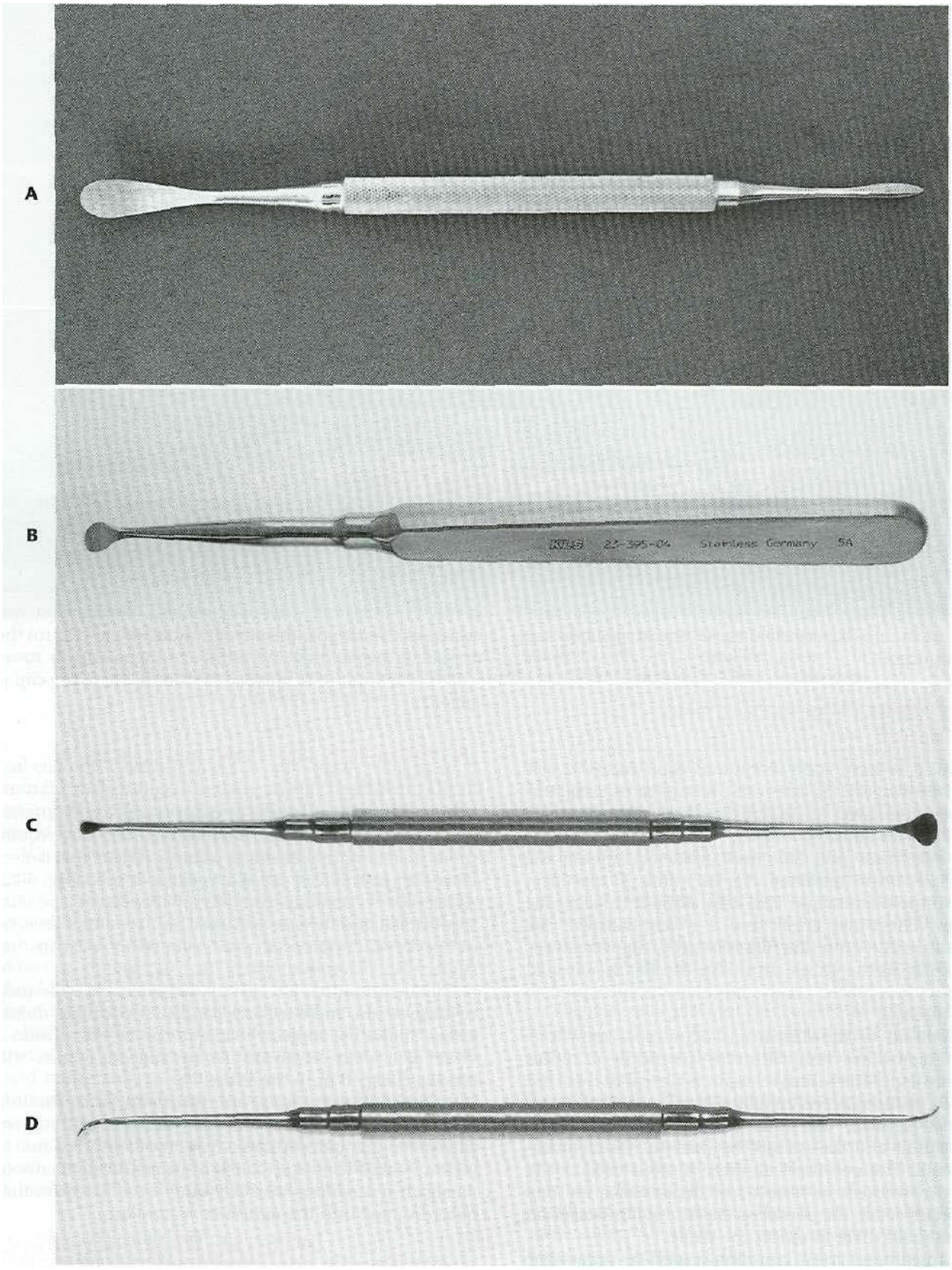


FIG. 6-5 A, No. 9 Molt periosteal elevator is most commonly used in oral surgery. B, A single-ended Molt periosteal elevator with a sharp round end may be used to elevate the mucoperiosteum. C and D, The double-ended Molt periosteal elevator has a large and small end to provide the surgeon the appropriate-size end for the specific task.

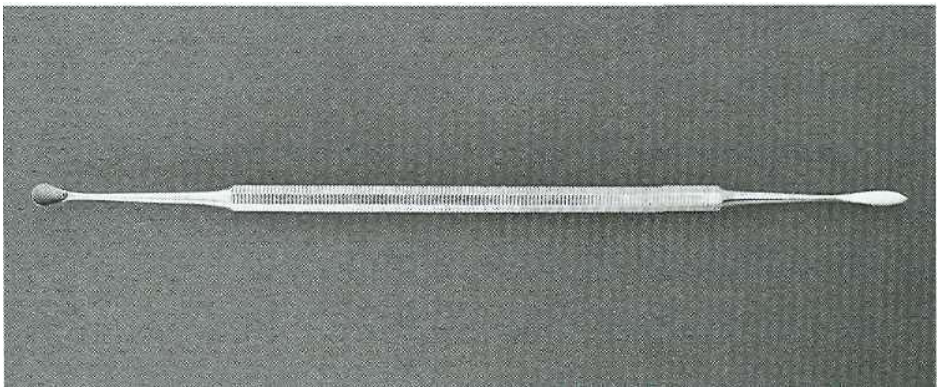


FIG. *6-6* No. 1 Woodson periosteal elevator is used to loosen soft tissue from teeth before extraction.

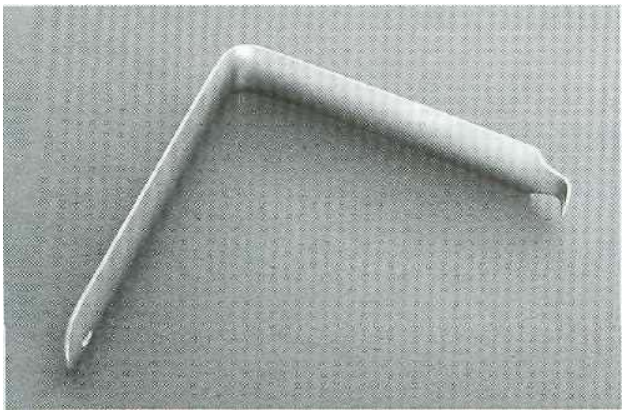


FIG. 6-7 Austin retractor is a right-angle retractor that can be used to retract cheek, tongue, or flaps.

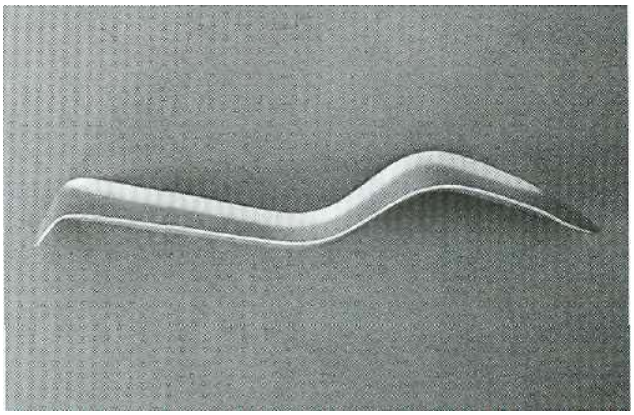


FIG. 6-8 Minnesota retractor is an offset retractor used for retraction of cheeks and flaps.

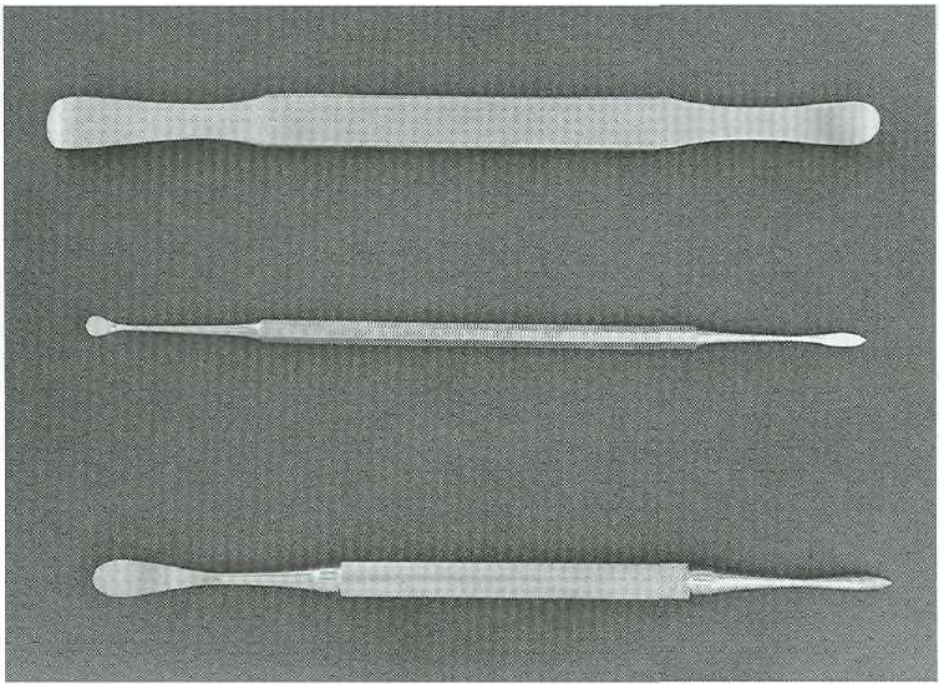


FIG. 6-9 Periosteal elevators such as Woodson and no. 9 Molt are useful to retract flaps. Seldin retractor *(top)* is broader instrument that provides broader retraction and increased visualization.

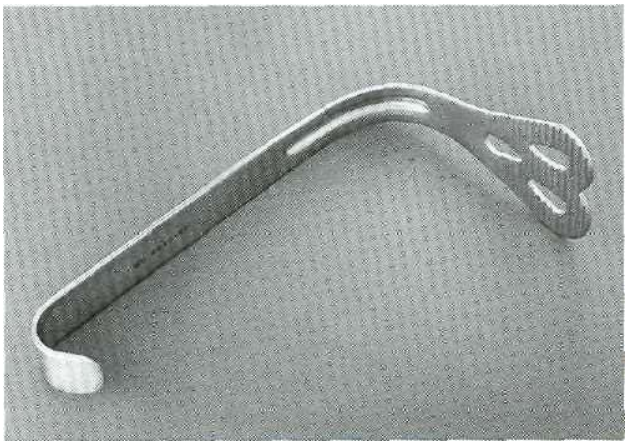


FIG. 6-10 Weider retractor is a large retractor designed to retract tongue. Serrated surface helps to engage tongue so that it can be held securely.

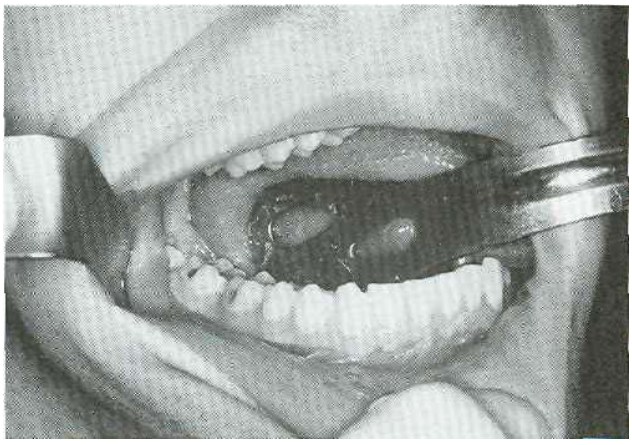


FIG. 6-11 Weider retractor is used to hold tongue away from surgical field. Austin retractor is used to retract cheek,

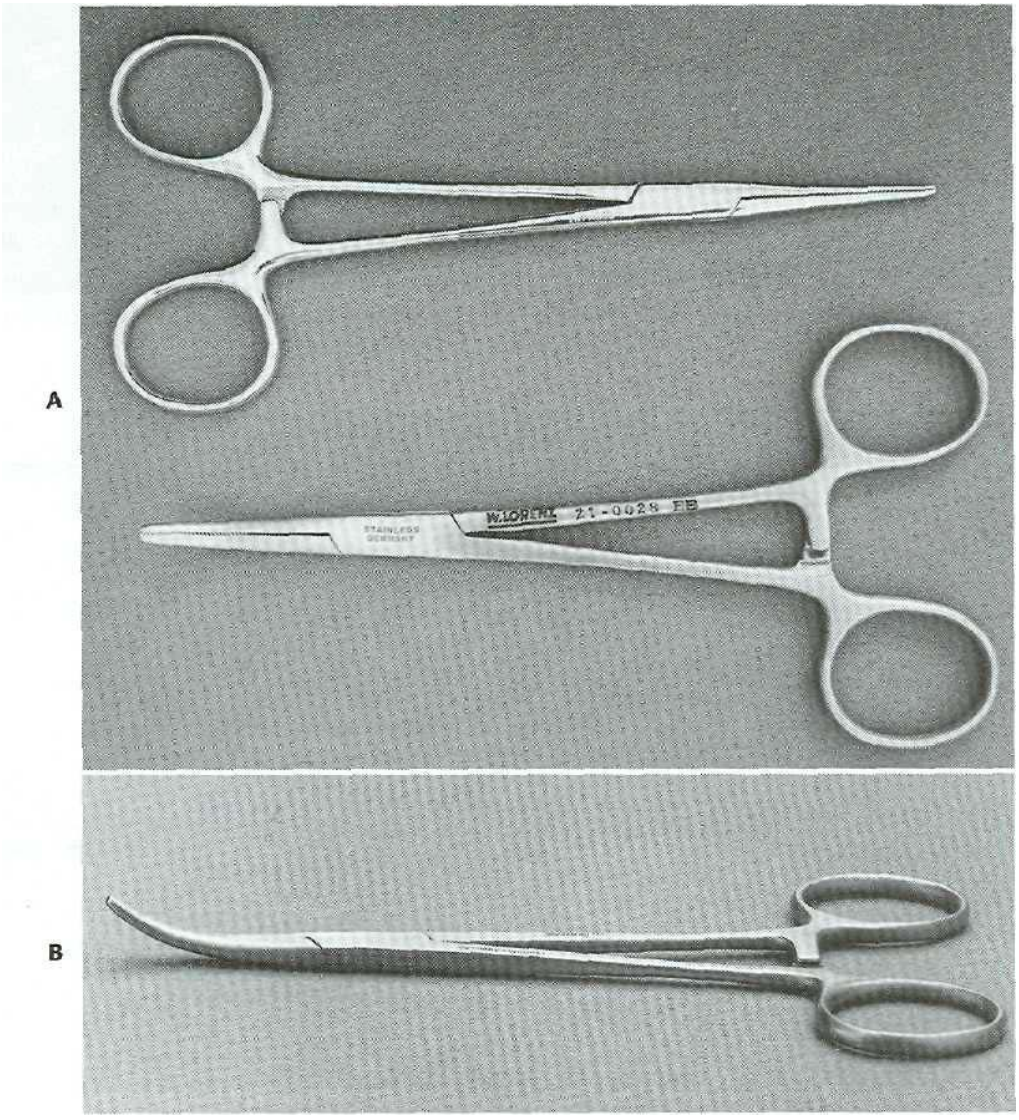


FIG. 6-12 A, Hemostats *(top view)* used in oral surgery. B, Curved hemostat *(side view).*

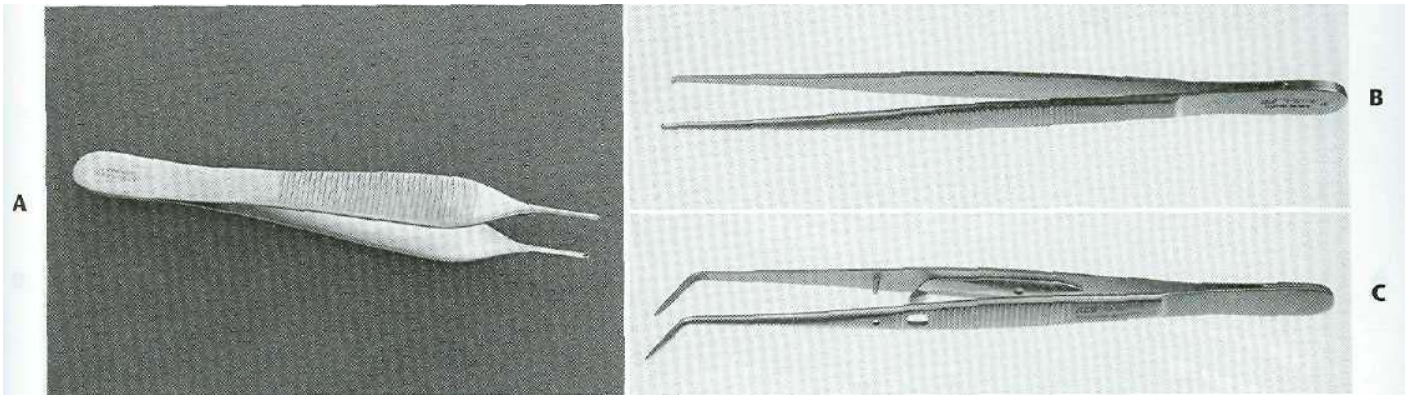


FIG. 6-13 A, Small, delicate Adson tissue forceps are used to gently stabilize soft tissue for suturing or dissection. B, The Stillies pickup is longer than the Adson pickup and is used to handle tissue in the more posterior aspect of the mouth. C, The college pliers is an angled forceps that is used for picking up small objects in the mouth or from the Mayo tray stand.

Adson forceps (pickups) (Fig. 6-13, *A)*. These are delicate forceps with small teeth, which can be used to gently hold tissue and thereby stabilize it. When this instrument is used, care should be taken not to grasp the tissue too tightly, thereby crushing it. Adson forceps are also available without teeth.

When working in the posterior part of the mouth, the Adson forceps may be too short. A longer forceps that has similar shape is the Stillies forceps. This forceps is usually 7 to 9 inches long and can easily grasp tissue in the posterior part of the mouth and still leave enough of the instrument protruding beyond the lips for the surgeon to control it (Fig. 6-13, *B)*.

Occasionally, it is more convenient to have an angled forceps. Such a forceps is the college, or cotton, forceps (Fig. 6-13, C). Although this forceps is not especially useful for handling tissue, it is an excellent instrument for picking up small fragments of tooth, amalgam, or other foreign material and for placing or removing gauze packs. This instrument is commonly used in tray systems.

In some types of surgery, especially when removing larger amounts of fibrous tissue, such as in an epulis fissuratum, forceps with locking handles and teeth that will grip the tissue firmly are necessary. In this situation the Allis tissue forceps are used (Fig. 6-14, *A* and *B)*. The locking handle allows the forceps to be placed in the proper position and then to be held by an assistant to provide the necessary tension for proper dissection of the tissue. The Allis forceps should never be used on tissue that is to be left in the mouth, because they cause a relatively large amount of tissue destruction as a result of crushing injury (Fig. 6-14, C).

Russian tissue forceps are large, round-ended tissue forceps (Fig. 6-15, *A)* that are most useful in oral surgery to pick up teeth that have been elevated from their sockets (Fig. 6-15, *B)*. The round end allows a positive grip on a tooth or tooth fragment so that it is not likely to slip out of the instrument's grip, as commonly occurs with the hemostat. The Russian forceps are also useful for placing gauze in the mouth when the surgeon is isolating a particular area for surgery.

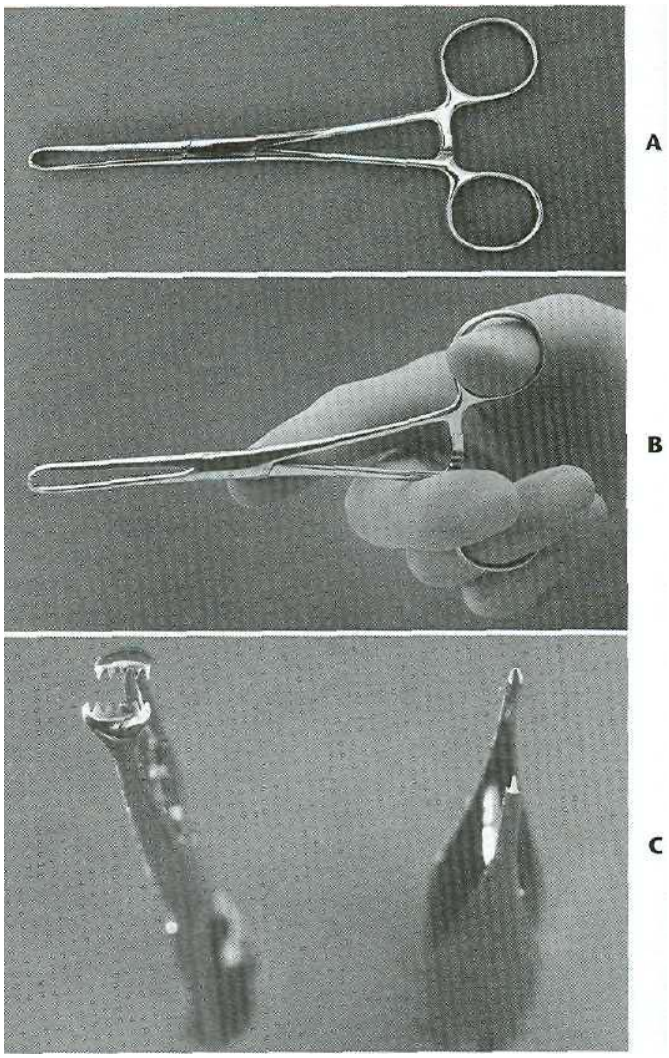


FIG. 6-14 A, Allis tissue forceps are useful for grasping and holding tissue that will be excised. B, Allis forceps are held in same fashion as needle holder. C, Comparison of Adson beaks *(right)* with Allis beaks *(left)* shows difference in their design and use.

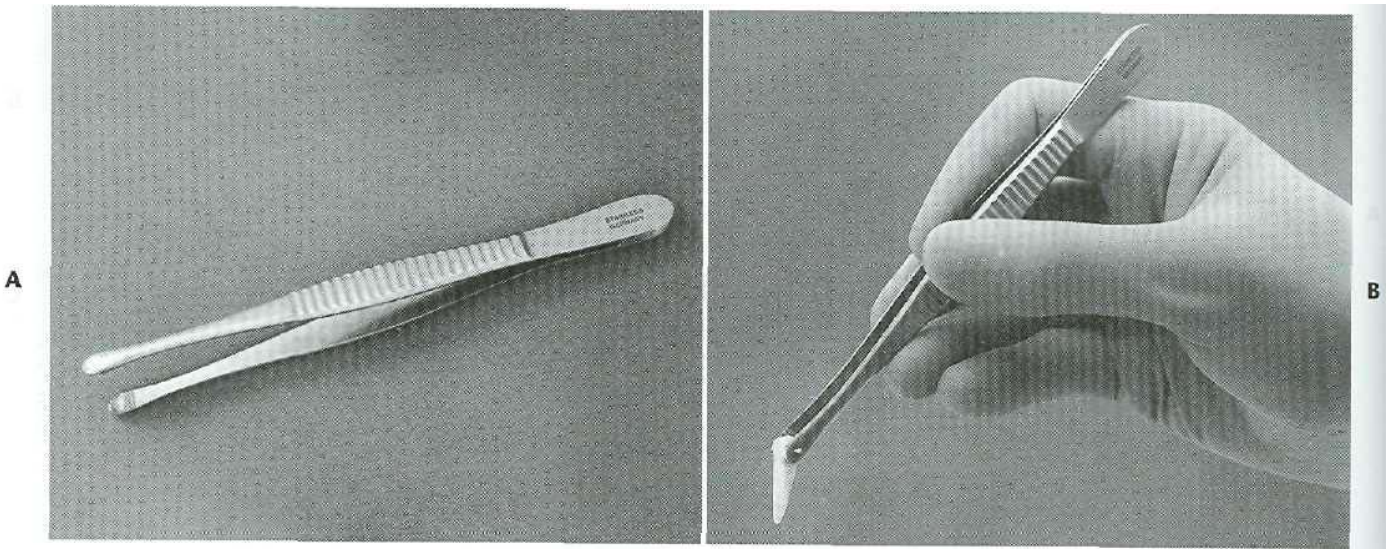


FIG. 6-15 A, Russian tissue forceps are round-ended pickups. B, Russian forceps are especially useful for grasping teeth that are loose in the mouth.

INSTRUMENTS FOR REMOVING BONE

Rongeur Forceps

The instrument most commonly used for removing bone is the rongeur forceps. This instrument has sharp blades that are squeezed together by the handles, cutting or pinching through the bone. Rongeur forceps have a leaf spring between the handle so that when hand pressure is released, the instrument will open. This allows the surgeon to make repeated cuts of bone without manually reopening the instrument (Fig, 6-16, *A).* The two major designs for rongeur forceps are (1) a side-cutting forceps and (2) the side-cutting and end-cutting forceps (Fig. 6-16, *B).*

The side-cutting and end-cutting forceps (Blumenthal rongeurs) are more practical for most dentoalveolar surgical procedures that require bone removal. Because they are end-cutting, these forceps can be inserted into sockets for removal of interradicular bone, but they can also be used to remove sharp edges of bone. Rongeurs can be used to remove large amounts of bone efficiently and quickly. Because rongeurs are relatively delicate instruments, the surgeon should not use the forceps to remove large amounts of bone in single bites. Rather, smaller amounts of bone should be removed in each of multiple bites. Likewise, the rongeurs should not be used to remove teeth, because this practice will quickly dull and destroy the instrument. Rongeurs are usually quite expensive, so care should be taken to keep them in working order.

Chisel and Mallet

One of the obvious methods of bone removal is to use a surgical chisel and mallet (Fig. 6-17, *A-C).* Bone is usually removed with a monobevel chisel, and teeth are usually sectioned with a bibevel chisel. The success of chisel use depends on the sharpness of the instrument. Therefore it is necessary to sharpen the chisel before it is sterilized for the next patient. Some chisels have carbide tips and can be used more than once between sharpenings. A mallet with a nylon facing imparts less shock to the patient, is less noisy, and is therefore recommended.

Bone File

Final smoothing of bone before suturing the mucoperiosteal flap back into position is usually performed with a small bone file (Fig. 6-18, *A).* The bone file is usually a double-ended instrument with a small and large end. It cannot be used efficiently for removal of large amounts of bone; therefore it is used only for final smoothing. The teeth of the bone file are arranged in such a fashion that they remove bone only on a *pull* stroke (Fig. 6-18, *B).* Pushing the bone file results only in burnishing and crushing the bone and should be avoided.

Bur and Handpiece

A final method for removing bone is with a bur and handpiece. This is the technique that most surgeons use when removing bone for surgical removal of teeth. Relatively high-speed handpieces with sharp carbide burs remove cortical bone efficiently. Burs such as a no. 557 or no. 703 fissure bur or a no. 8 round bur are used. When large amounts of bone must be removed, such as in torus reduction, a large bone bur that resembles an acrylic bur is used. The handpiece that is used must be completely sterilizable in a steam autoclave. When a handpiece is purchased, the manufacturer's specifications must be checked carefully to ensure that this is possible. The handpiece should have relatively high speed and torque (Fig. 6-19). This allows the bone removal to be done rapidly and allows efficient sectioning of teeth. The handpiece must not exhaust air into the operative field as do dental drills. Most high-speed turbine drills used for routine restorative dentistry must not be used. The reason is

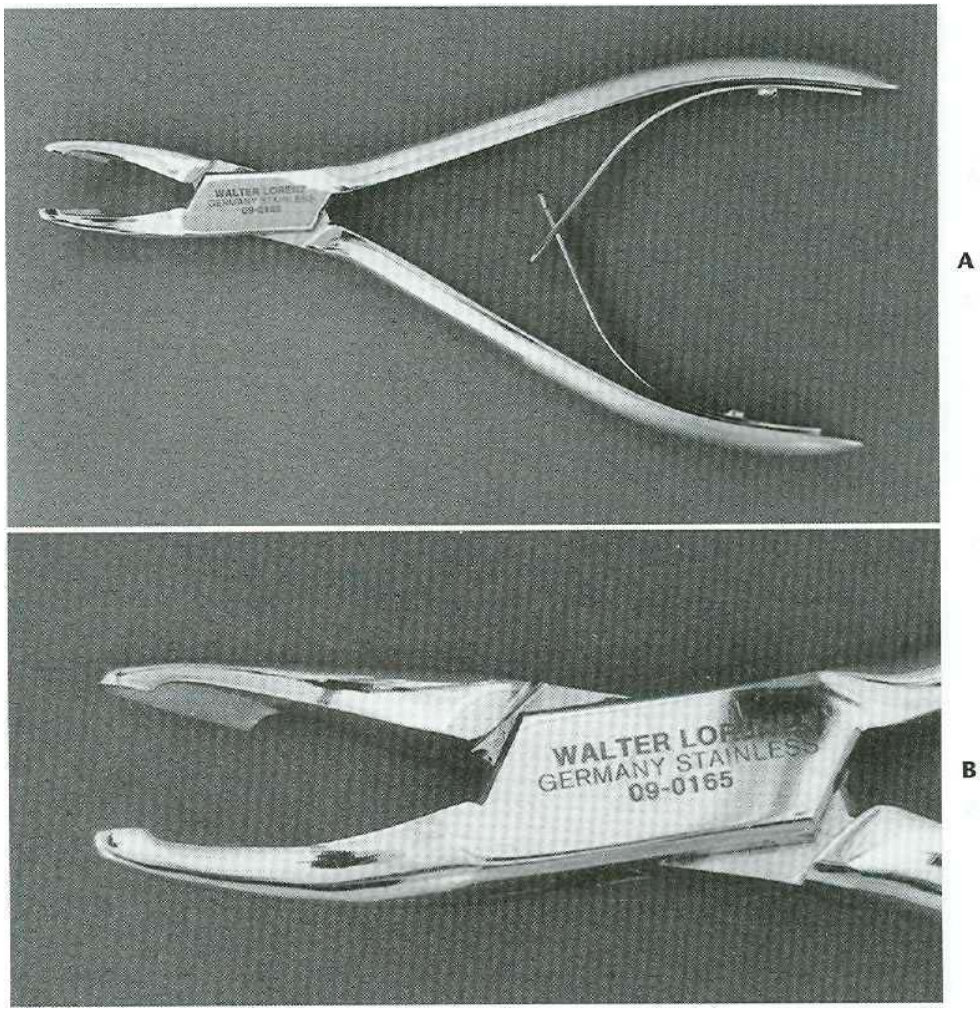


FIG. 6-16 A, Rongeurs are bone-cutting forceps that have spring-loaded handles. B, Blumenthal rongeurs are combination end-cutting and side-cutting blades. They are preferred for oral surgery procedures.

that the air exhausted into the wound may be forced into deeper tissue planes and produce tissue emphysema, a potentially dangerous occurrence.

INSTRUMENTS FOR REMOVING SOFT TISSUE FROM BONY DEFECTS

The periapical curette is an angled, double-ended instrument used to remove soft tissue from bony defects {Fig. 6-20). The principal use is to remove granulomas or small cysts from periapical lesions, but it is also used to remove small amounts of granulation tissue debris from the tooth socket. The periapical curette is distinctly different from the periodontal curette in design and function.

INSTRUMENTS FOR SUTURING MUCOSA

Once a surgical procedure has been completed, the mucoperiosteal flap is returned to its original position and held in place by sutures. The needle holder is the instrument used to place the sutures.

Needle Holder

The needle holder is an instrument with a locking handle and a short, stout beak. For intraoral placement of sutures, a 6-inch (15-cm) needle holder is usually recommended (Fig. 6-21). The beak of the needle holder is shorter and stronger than the beak of the hemostat (Fig. 6-22, *A).* The face of the beak of the needle holder is crosshatched to permit a positive grasp of the suture needle and suture. The hemostat has parallel grooves on the face of the beaks, thereby decreasing the control over needle and suture. Therefore the hemostat should not be used for suturing (Fig. 6-22, *B).*

To properly control the locking handles and to direct the relatively long needle holder, the surgeon must hold the instrument in the proper fashion (Fig. 6-23). The thumb and ring finger are inserted through the rings. The index finger is held along the length of the needle holder to steady and direct it. The second finger aids in controlling the locking mechanism. The index finger should not be put through the finger ring, because this will result in dramatic decrease in control.

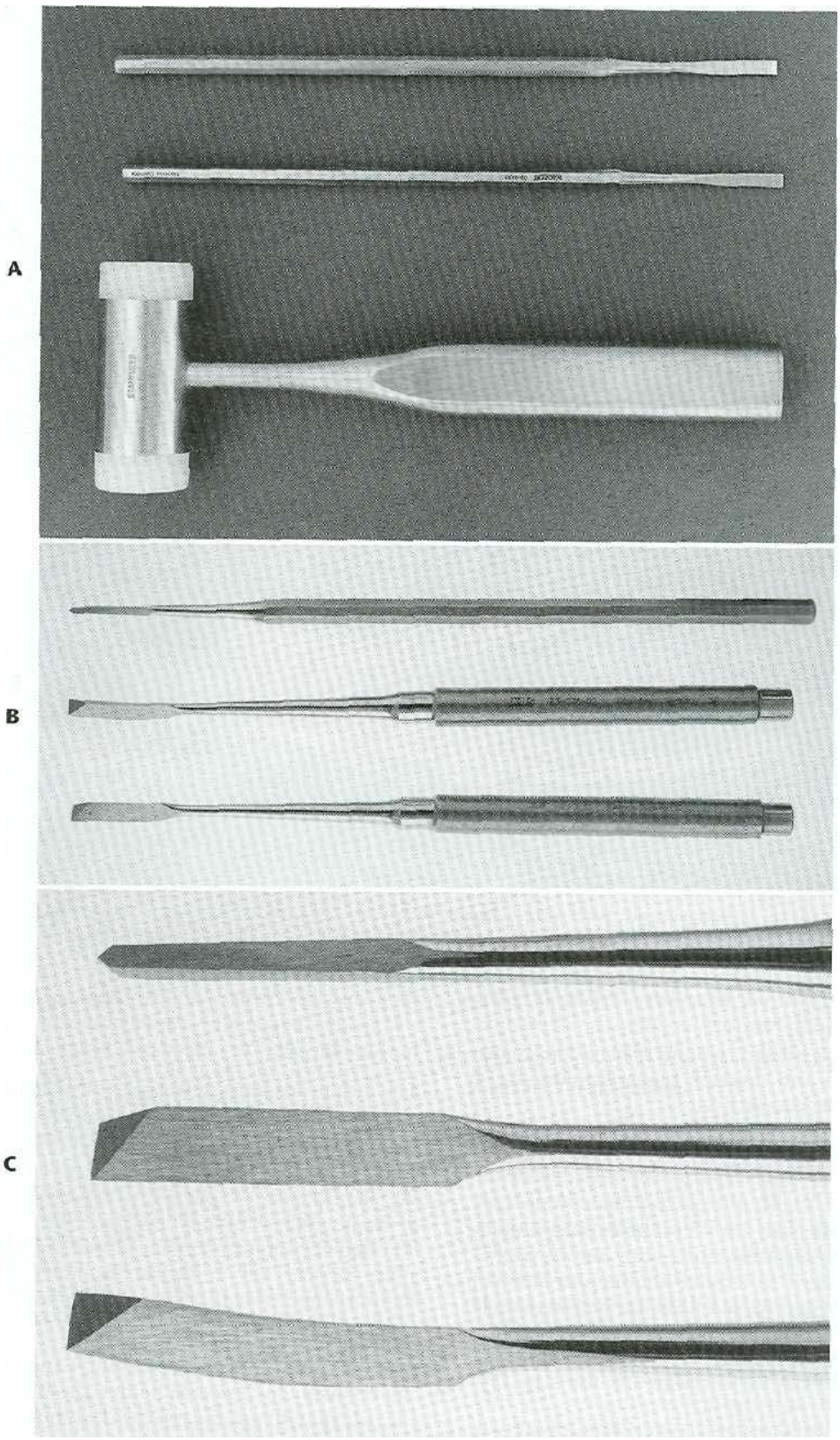


FIG.6-17 A, Surgical chisel and mallet can be used for removing bone and sectioning teeth. B, Additional chisels are straight unibevel chisel, curved unibevel chisel, or straight bibeve! chisel. C, A close-up view of the chisel working end shows the bibevel end, the straight unibevel end, and the curved unibevel end.

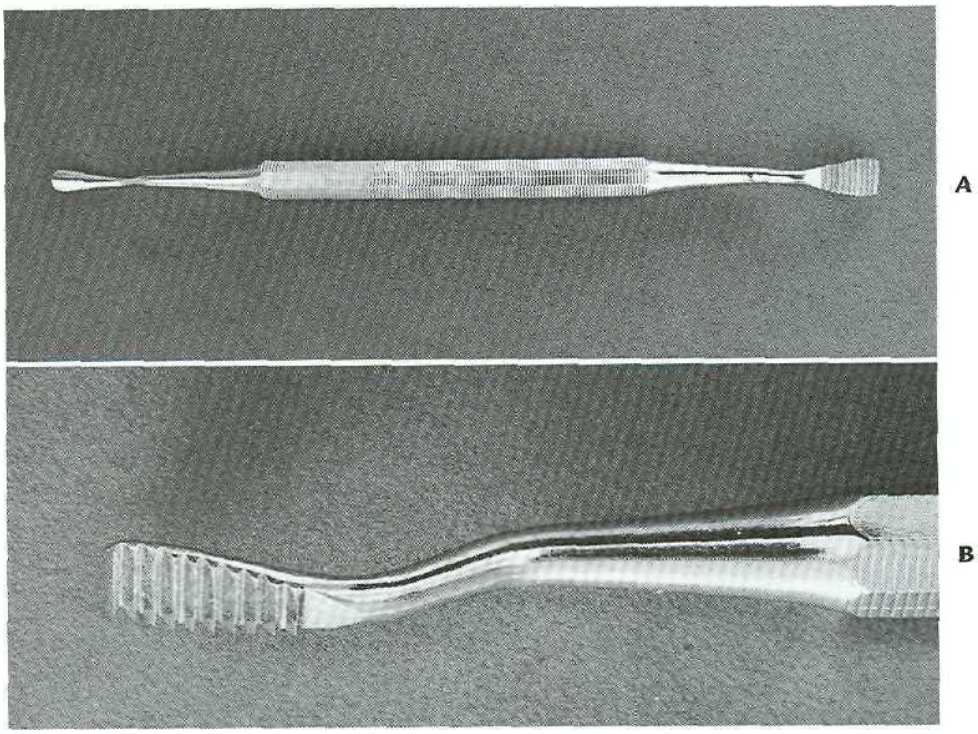


FIG. 6-18 A, Double-ended bone file is used for smoothing small, sharp edges or spicules of bone. B, Teeth of bone file are effective only in pull stroke.

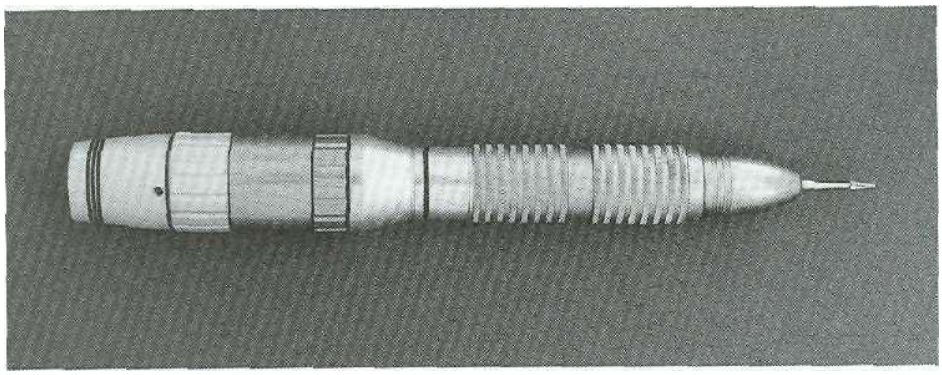


FIG. 6-19 Typical moderate-speed, high-torque, sterilizable hand piece with 703 bur.

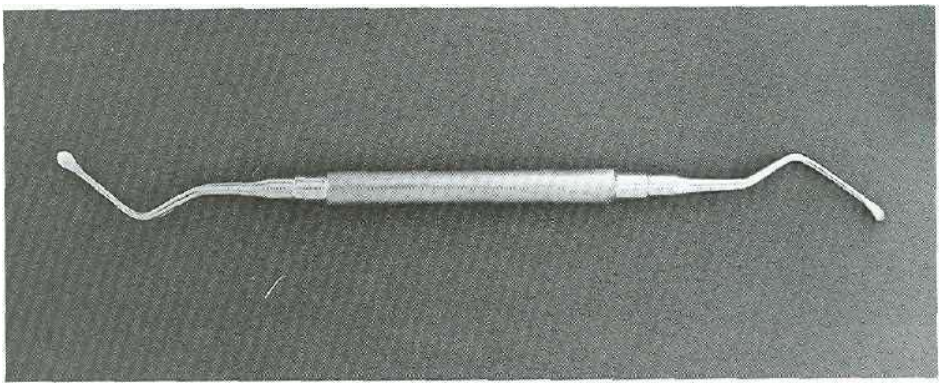


FIG. 6-20 Periapicai curette is a double-ended, spoon-shaped instrument used to remove soft tissue from bony defects.

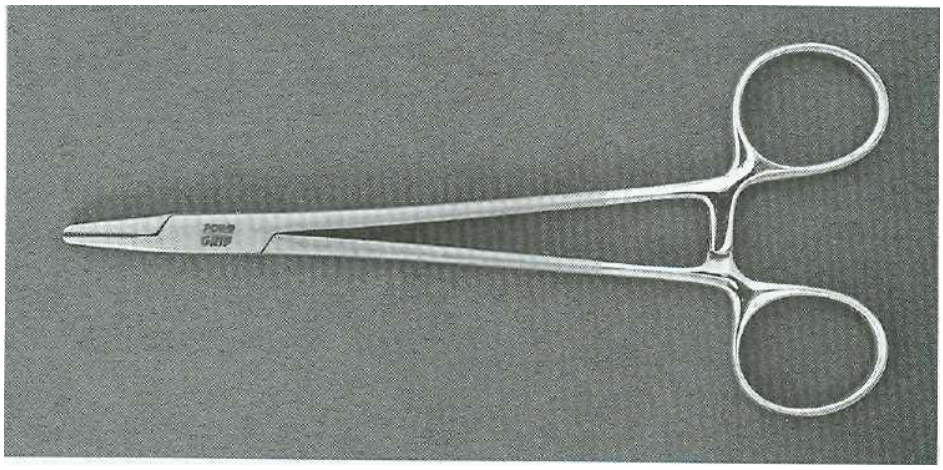


FIG. 6-21 Needle holder has locking handle and short, stout beak.

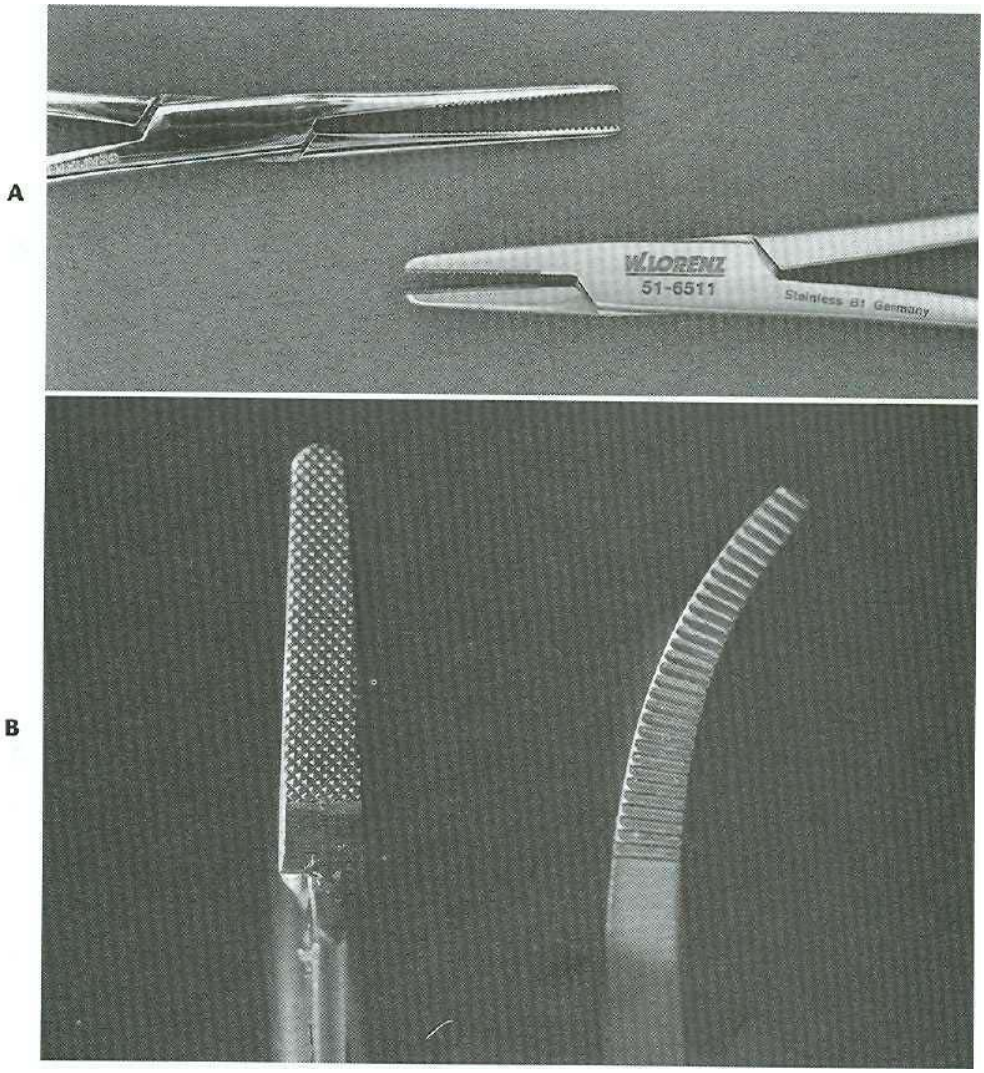


FIG. 6-22 A, Hemostat *(top)* has longer, thinner beak compared with needle holder *(bottom)* and therefore should not be used for suturing. B, Face of shorter beak of needle holder is crosshatched to ensure positive grip on needle *(left)*. Face of hemostat has parallel grooves that do not allow a firm grip on needle *(right)*.

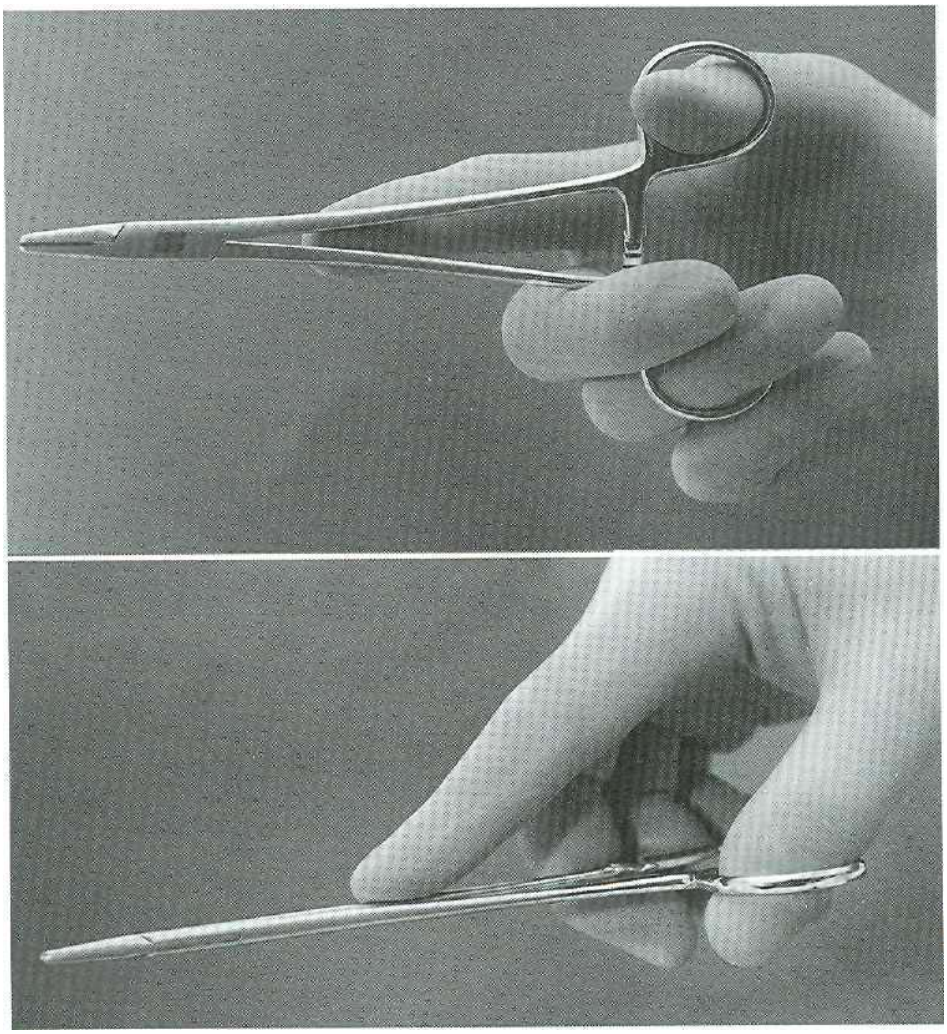


FIG. 6-23 Needle holder is held by using thumb and ring finger in rings *(top)* and first and second finger to control instrument *(bottom)*.

Needle

The needle used in closing mucosal incisions is usually a small half-circle or three eighths-circle suture needle. It is curved to allow the needle to pass through a limited space, where a straight needle could not reach. Suture needles come in a large variety of shapes, from very small to very large (Fig. 6-24, *A)*. The tips of suture needles are either tapered, such as a sewing needle, or they have triangular tips that allow them to be cutting needles (Fig. 6-24, *B)*. A cutting needle will pass through mucoperiosteum more easily than the tapered needle. The cutting portion of the needle extends about one third the length of the needle, and the remaining portion of the needle is round. The suture can be threaded through the eye of the needle or can be purchased already swaged on by the manufacturer (Fig. 6-24, C). if the dentist chooses to load his or her own needles for the sake of economy, needles that have eyes (like those in typical sewing needles) must be used. If the dentist chooses to use the disposable needles, then the suture will be swaged onto the needle. Needles that have eyes are larger at the tip and may cause slightly increased tissue injury compared with the swaged-on needles.

The curved needle is held approximately two thirds of the distance between the tip and the end of the needle (Fig. 6-25). This allows enough of the needle to be exposed to pass through the tissue, while allowing the needle holder to grasp the needle in its strong portion to prevent bending of the needle. Techniques for placing sutures are discussed in Chapter 8.

Suture Material

Many types of suture materials are available. The materials are classified by size, resorbability, and whether or not they are monofilament or polyfilament.

The size of suture is designated by a series of zeros. The size most commonly used in the suturing of oral mucosa is 3-0 (000). A larger size suture would be 2-0, or 0. Smaller sizes would be 4-0, 5-0, and 6-0 sutures. Sutures of very fine size, such as 6-0, are usually used in conspicuous places on the skin, such as the face, because smaller

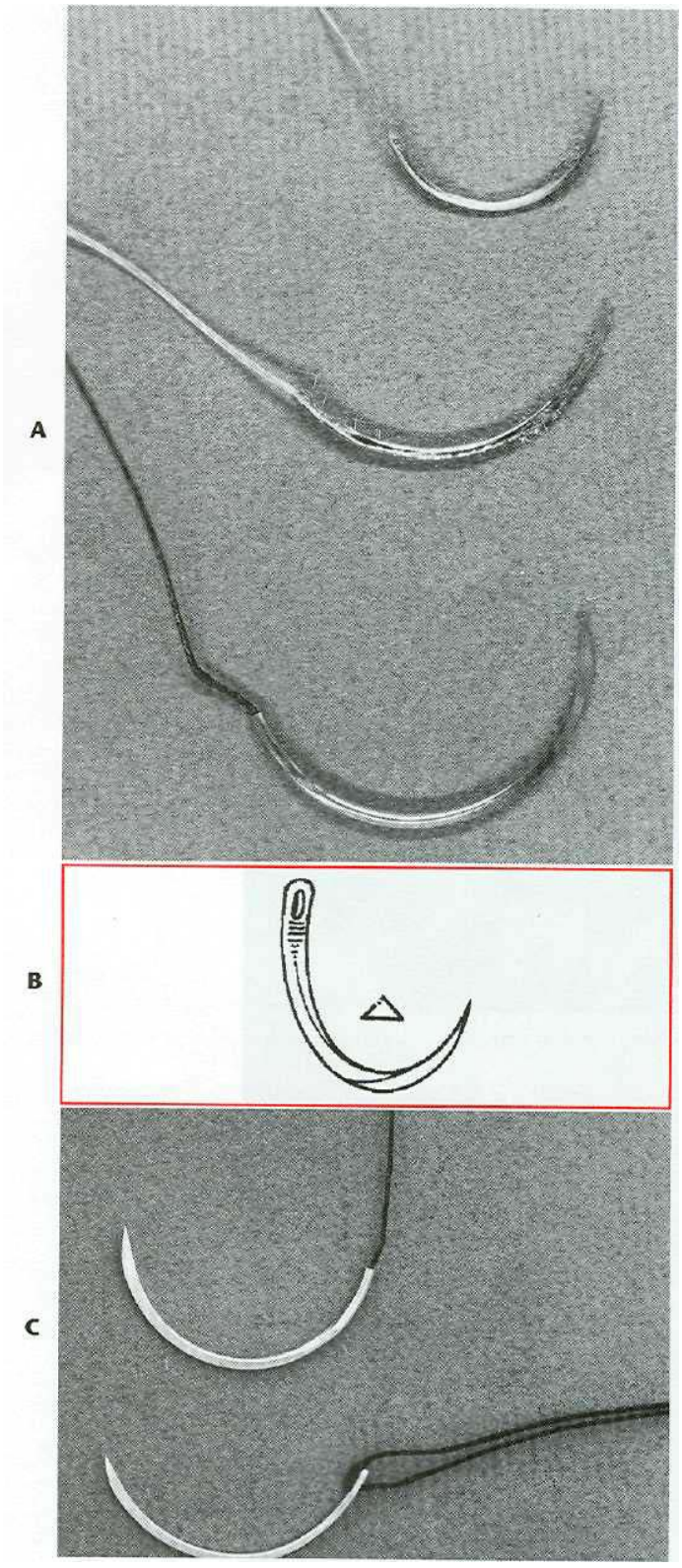


FIG. 6-24 A, Comparison of needles used in oral surgery. Top is P-3 needle, which is usually 4-0 size suture. Middle is F5-2 needle, and bottom is X-1. All are cutting needles. B, Tip of needle used to suture mucoperiosteum is triangular in cross section to make it a cutting needle. C, Suture may be threaded through needle eye or can be purchased already swaged onto needle.

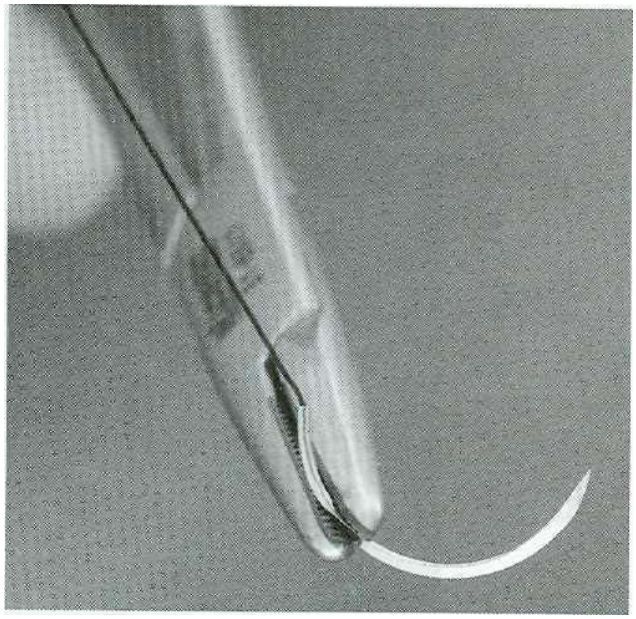


FIG. 6-25 Needle holder grasps curved needle two thirds of the distance from tip of needle.

sutures usually cause less scarring. Sutures of size 3-0 are large enough to prevent tearing through mucosa, are strong enough to withstand the tension placed on them intraorally, and are strong enough for easy knot tying with a needle holder.

Sutures may be resorbable or nonresorbable. Nonresorbable suture materials include such types as silk, nylon, and stainless steel. The most commonly used nonresorbable suture in the oral cavity is silk. Nylon and stainless steel are rarely used in the mouth. Resorbable sutures are primarily made of gut. Although the term *catgut* is often used to designate this type of suture, gut actually is derived from the serosal surface of sheep intestines. Plain catgut resorbs relatively quickly in the oral cavity, rarely lasting longer than 5 days. Gut that has been treated by tanning solutions (chromic acid) and is therefore called *chromic gut* lasts longer—up to 10 to 12 days. Several synthetic resorbable sutures are also available. These are materials that are long chains of polymers braided into suture material. Examples are polyglycolic acid and poly lactic acid. These materials are slowly resorbed, taking up to 4 weeks before they are resorbed. Such long-lasting resorbable sutures are rarely indicated in the oral cavity.

Finally, sutures are classified based on whether or not they are monofilament or polyfilament. Monofilament sutures are sutures such as both plain and chromic gut, nylon, and stainless steel. Polyfilament sutures are silk, polyglycolic acid, and polylactic acid. Sutures that are made of braided material are easy to handle and tie and rarely come untied. The cut ends are usually soft and nonirritating to the tongue and surrounding soft tissues. However, because of the multiple filaments, they tend to "wick" oral fluids along the suture to the underlying tissues. This wicking action may carry bacteria along with the saliva. Monofilament sutures do not cause this wick-

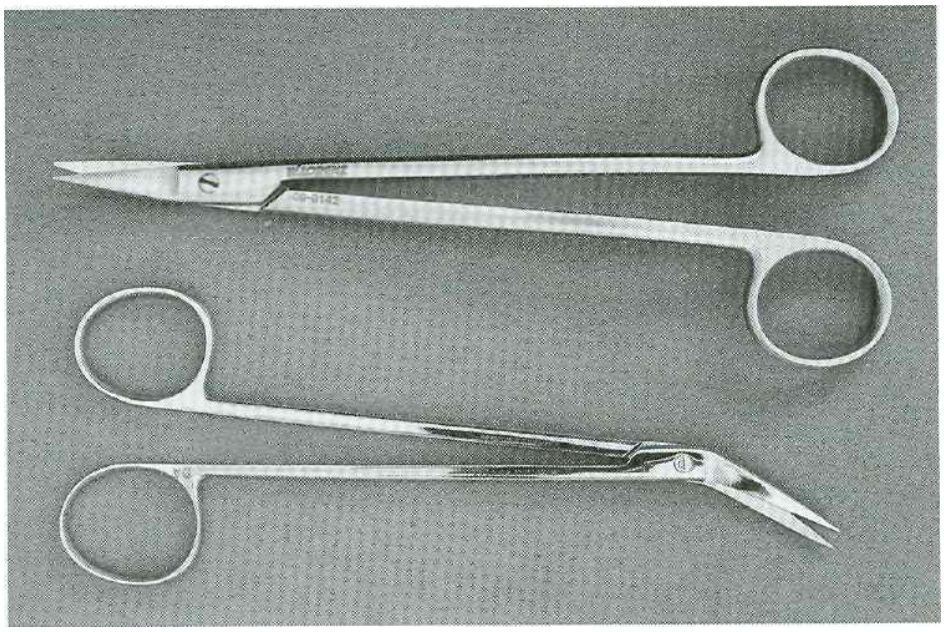


FIG. 6-26 **Suture** scissors have **long** handles and short blades. Blades may be angled slightly in either of two directions.

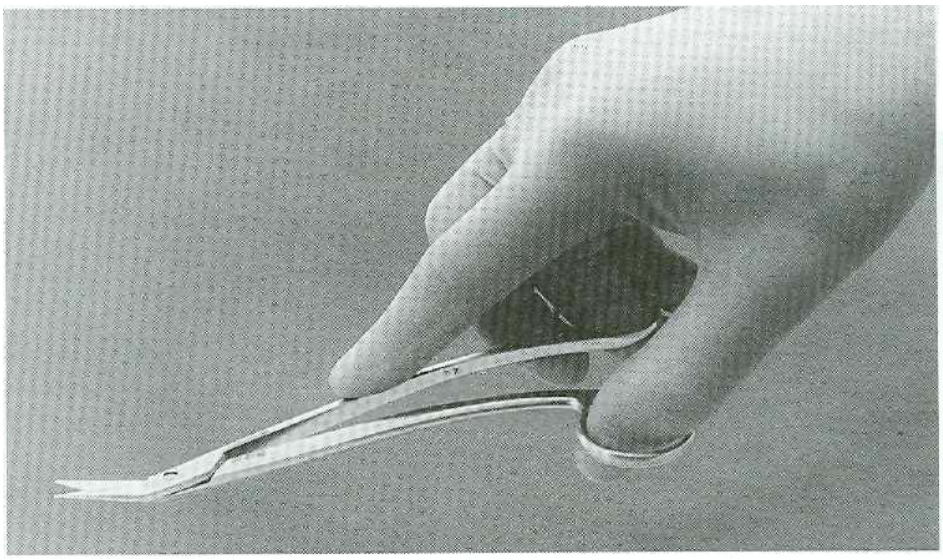


FIG. 6-27 Suture scissors should be held in same fashion as needle holder.

ing action but may be more difficult to tie, tend to come untied, and are stiffer and therefore more irritating to the tongue and soft tissues.

The most commonly used suture for the oral cavity is 3-0 black silk. The size 3-0 has the appropriate amount of strength; the polyfilament nature of the silk makes it easy to tie and easily tolerated by the patient's soft tissues. The black color makes the suture easy to see when the patient returns for suture removal. Sutures that are holding mucosa together usually stay no longer than 5 to 7 days, so the wicking action is of little clinical importance. (Techniques for suturing and knot tying are presented in Chapter 8.)

Scissors

The final instruments necessary for placing sutures are suture scissors (Fig. 6-26). Suture scissors usually have relatively long handles and thumb and finger rings. They are held in the same way as the needle holder. The suture scissors usually have short cutting edges, because their soie purpose is to cut sutures (Fig. 6-27). The most commonly used suture scissors are the Dean scissors. These have slightly curved handles and serrated blades that make cutting sutures easier.

An additional type of scissors is designed for soft tissue. The two major types of tissue scissors are (1) the Iris scis-

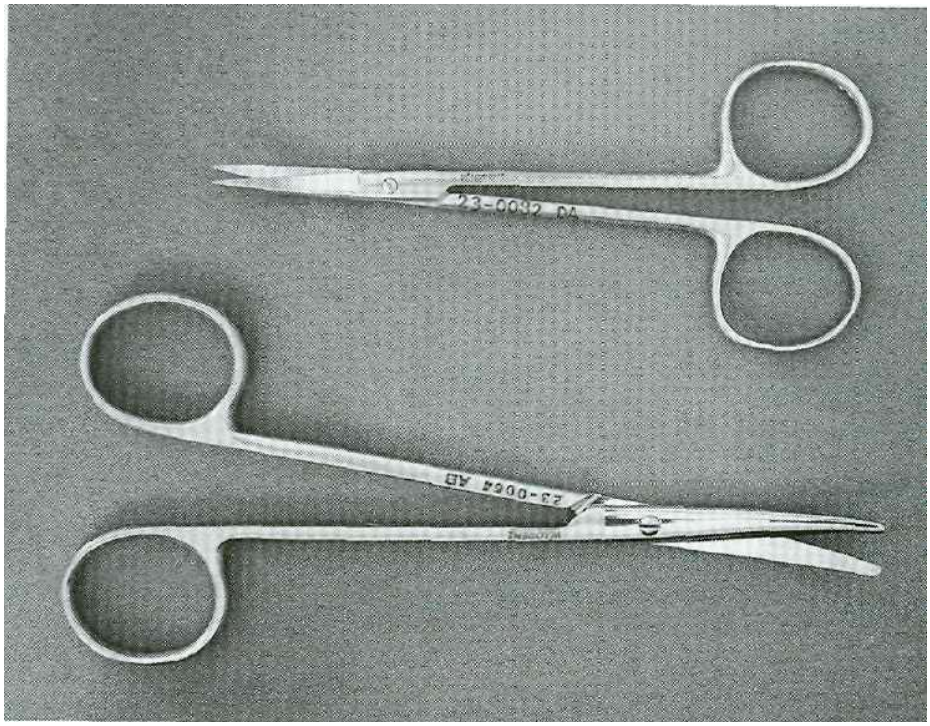
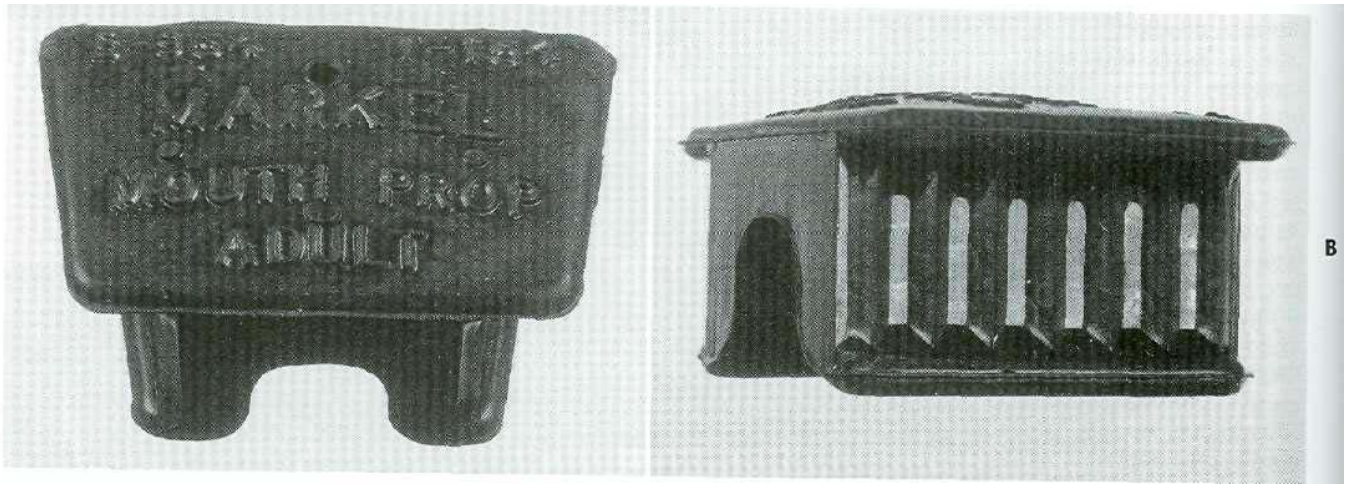


FIG. 6-28 Soft tissue scissors are of two designs: Iris scissors ***(top)*** are small, sharp-pointed scissors. Metzenbaum scissors *(bottom)* are longer, delicate, blunt-nosed scissors.



.FIG. 6-29 A, Rubber bite block is used to hold mouth open in position chosen by patient. B, The sides of the bite block are corrugated to provide a surface for the teeth to engage.

sors and (2) the Metzenbaum scissors (Fig. 6-28). The Iris scissors are small, sharp-pointed delicate tools used for fine work. The Metzenbaum scissors are blunt-nosed scissors used for undermining soft tissue, as well as for cutting. Tissue scissors such as the Iris or Metzenbaum scissors should not be used to cut sutures, because the suture material will dull the edges of the blades and make them less effective for cutting tissue. The exception is when removing very fine sutures placed in skin incisions in the face. Scissors with thin, pointed tips such as an Iris may be useful.

INSTRUMENTS FOR HOLDING MOUTH OPEN

When performing extractions of mandibular teeth, it is necessary to support the mandible to prevent stress on the temporomandibular joints (TMJs). By having the patient's jaw supported on a bite block, the joints will be protected. The bite block is just what the name implies (Fig. 6-29, *A* and B). It is a rubber block on which the patient can rest the teeth. The patient opens the mouth to a comfortably wide position, and the rubber bite block is inserted, which holds the mouth in the desired posi-

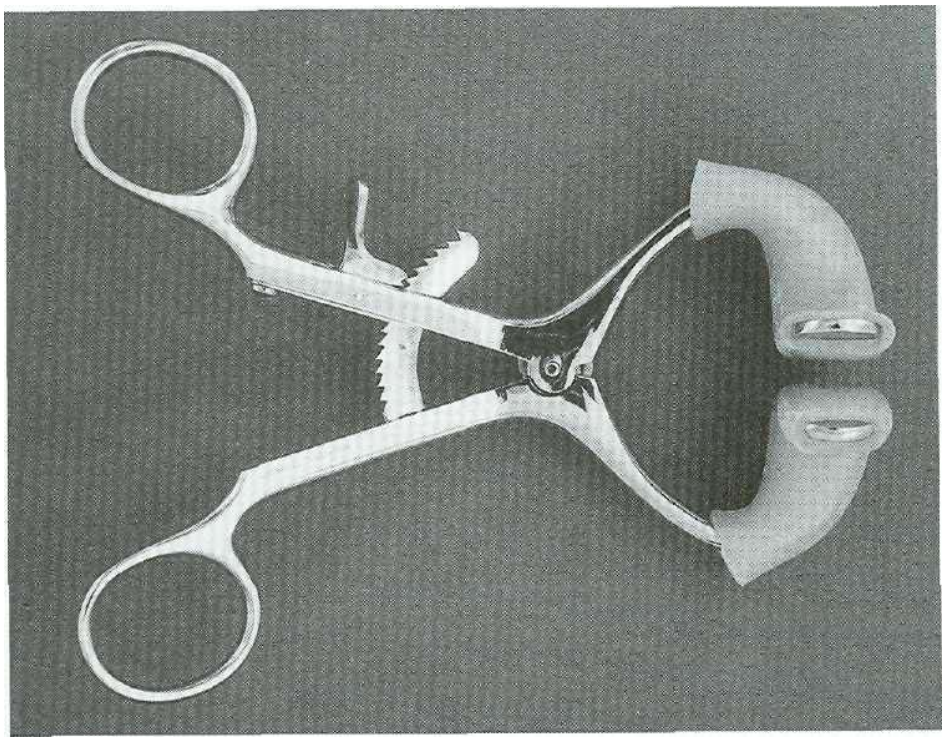


FIG. 6-30 Side-action, or Molt, mouth prop can be used to open patient's mouth when patient is unable to cooperate, such as during sedation.

tion. Should the surgeon need the mouth to open wider, the patient must open widely and the bite block must be positioned more to the posterior of the mouth.

The side-action mouth prop or Molt mouth prop (Fig. 6-30) can be used by the operator to open the mouth wider if necessary. This mouth prop has a ratchet-type action, opening the mouth wider as the handle is closed. This type of mouth prop should be used with caution, because great pressure can be applied to the teeth and TMJ, and injury may occur with injudicious use. This type of mouth prop is useful in patients who are deeply sedated.

Whenever a bite block or side-action mouth prop is used, the surgeon should take care to avoid opening the mouth too widely, because it may cause stress on the jaw joint. Occasionally, this may result in stretch injury to the joint, necessitating additional treatment. When long procedures are being performed, it is a good idea to periodically remove the prop and allow the patient to move the jaw and rest the muscles for a short time.

INSTRUMENTS FOR PROVIDING SUCTION

To provide adequate visualization, blood, saliva, and irrigating solutions must be suctioned from the operative site. The surgical suction is one that has a smaller orifice than the type used in general dentistry so that the tooth sockets can be suctioned in case a root tip is fractured and adequate visualization is necessary. Many of these suctions are designed with several orifices so that the soft tissue will not become aspirated into the suction hole and cause tissue injury (Fig. 6-31, A).

The Fraser suction has a hole in the handle portion that can be covered as the requirement dictates. When hard tissue is being cut under copious irrigation, the hole is covered so that the solution is removed rapidly. When soft tissue is being suctioned, the hole is uncovered to prevent tissue injury (Fig. 6-31, B).

INSTRUMENTS FOR TRANSFERRING STERILE INSTRUMENTS

The transfer forceps are heavy forceps used to move instruments from one sterile area to another (Fig. 6-32, *A*). These forceps are usually right-angled forceps with heavy jaws, so instruments such as extraction forceps can be moved from one area to another and small items can be handled without dropping them (Fig. 6-32, *B* and C). The transfer forceps are stored in a container that is usually filled with a bactericidal solution, such as glutaraldehyde. The container must be emptied and new solution placed at least every other day. The container should be thoroughly washed and autoclaved at least once per week.

INSTRUMENT FOR HOLDING TOWELS AND DRAPES IN POSITION

When drapes are placed around a patient, they must be held together with a towel clip (Fig. 6-33). This instrument has a locking handle and finger and thumb rings. The action ends of the towel clip are sharp, curved points that penetrate the towels and drapes. When this instru-

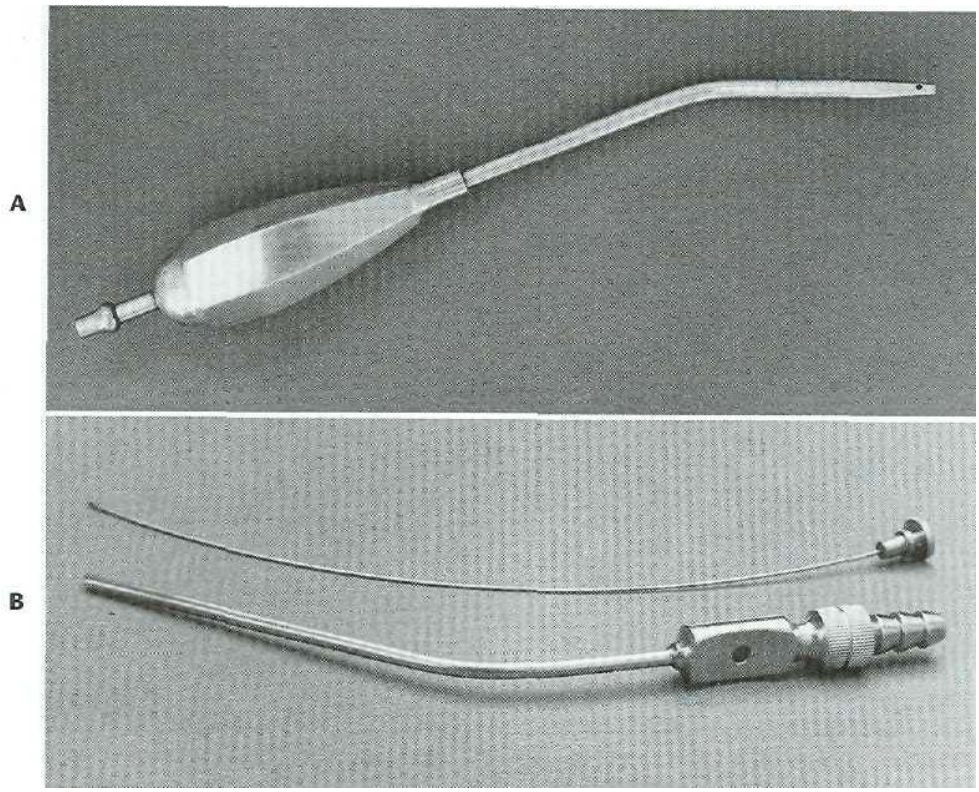


FIG. 6-31 A, Typical surgical suction has small-diameter tip. B, Fraser suction tip has blade in handle to allow operator more control over amount of suction power. Suction tip has hole in side to prevent tissue injury caused by excess suction pressure. Wire stylet is used to clean tip when bone or tooth particles plug suction.

ment is used, the operator must take extreme caution not to pinch the patient's underlying skin.

INSTRUMENTS FOR IRRIGATION

When a handpiece and bur are used to remove bone, it is essential that the area be irrigated with a steady stream of irrigating solution, usually sterile saline. The irrigation cools the bur and prevents bone-damaging heat buildup. The irrigation also increases the efficiency of the bur by washing away bone chips from the flutes of the bur and by providing a certain amount of lubrication. In addition, once a surgical procedure is completed and before the mucoperiosteal flap is sutured back into position, the surgical field should be irrigated thoroughly with saline. A large plastic syringe with a blunt 18-gauge needle is used for irrigation purposes. Although the syringe is disposable, it can be sterilized multiple times before it must be discarded. The needle should be blunt and smooth so that it does not damage soft tissue, and it should be angled for more efficient direction of the irrigating stream (Fig. 6-34, *A* and *B*).

DENTAL ELEVATORS

One of the most important instruments used in the extraction procedure is the dental elevator. These instruments are used to luxate teeth (loosen them) from the surrounding bone. Loosening teeth before the application of the dental forceps can frequently make a difficult extraction easier. By luxating the teeth before the application of the forceps, the clinician can minimize the incidence of broken roots and teeth. Finally, luxation of teeth before forceps application facilitates the removal of a broken root should it occur, because the root will be loose in the dental socket. In addition to their role in loosening teeth from the surrounding bone, dental elevators are also used to expand alveolar bone. By expanding the buccocortical plate of bone, the surgeon facilitates the removal of a tooth that has a limited and somewhat obstructed path for removal. Finally, elevators are used to remove broken or surgically sectioned roots from their sockets. Elevators are designed with specific shapes to facilitate the removal of roots from sockets.

Components

The three major components of the elevator are the handle, shank, and blade (Fig. 6-35). The handle of the elevator is usually of generous size, so it can be held comfortably in the hand to apply substantial but controlled force. The application of specifically applied force is critical in the proper use of dental elevators. In some situations, crossbar or T-bar handles are used. These instruments must be used with caution, because they can generate a very large amount of force (Fig. 6-36).

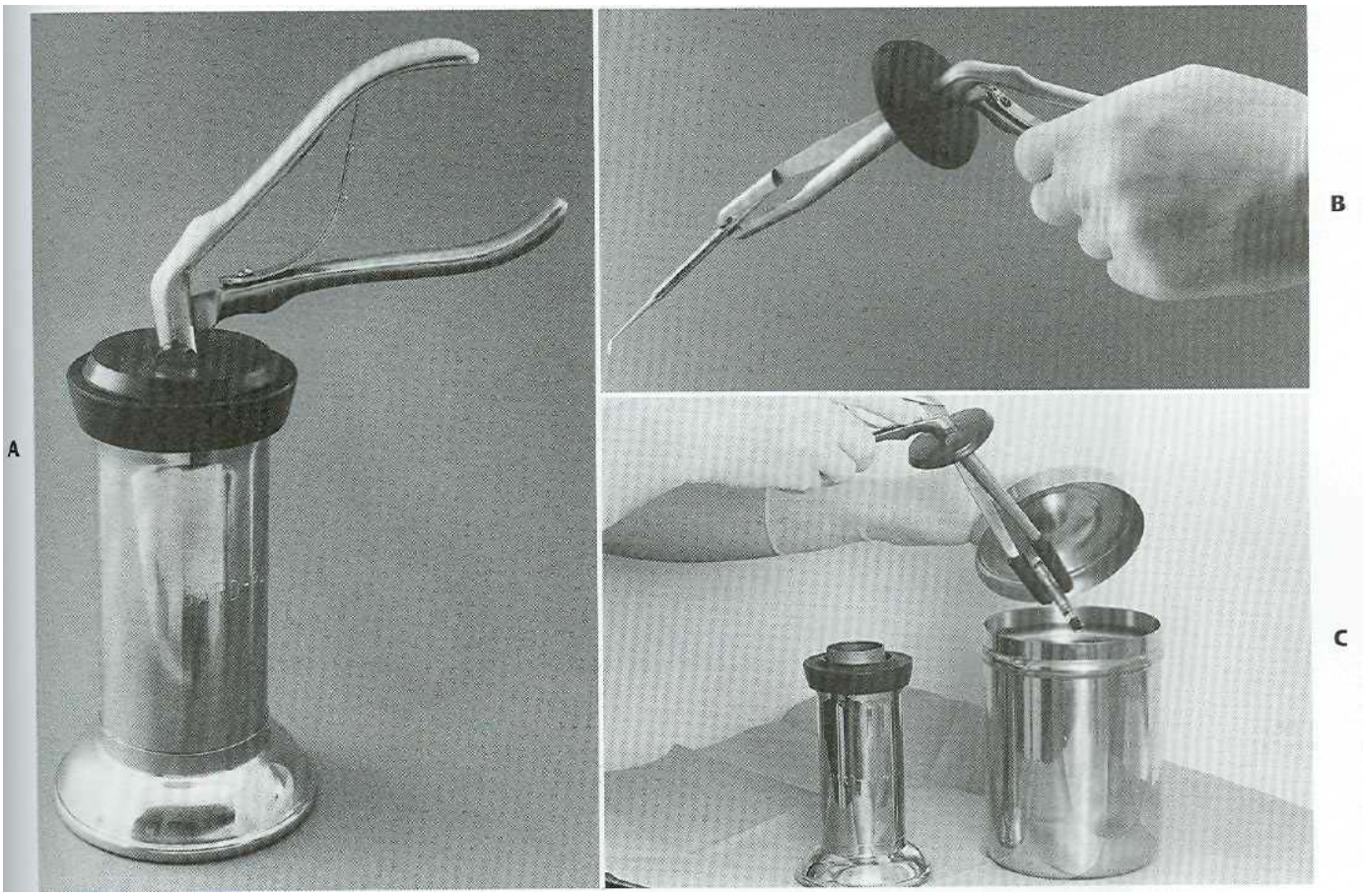


FIG. 6-32 A, Transfer forceps are used to move sterile instruments from one sterile area to another. B, These forceps are sturdy enough to move instruments without fear of loosing grip on them. C, Transfer forceps can also be used to handle small items, such as anesthetic cartridges.

The shank of the elevator simply connects the handle to the working end, or blade, of the elevator. The shank is generally of substantial size and is strong enough to transmit the force from the handle to the blade. The blade of the elevator is the working tip of the elevator and is used to transmit the force to the tooth, bone, or both.

Types

The biggest variation in the type of elevator is in the shape and size of the blade. The three basic types of elevators are (1) the straight or gouge type; (2) the triangle or pennant-shape type; and (3) the pick type. The straight or gouge type elevator is the most commonly used elevator to luxate teeth (Fig. 6-37, *A*). The blade of the straight elevator has a concave surface on one side so that it can be used in the same fashion as a shoehorn (Fig. 6-37, *B* and *Q*. The small straight elevator, no. 301, is frequently used for beginning the luxation of an erupted tooth, before application of the forceps (Fig. 6-38). The larger straight elevator is used to displace roots from their sockets and is also used to luxate teeth that are more widely spaced. The most commonly used large straight elevator is the no. 34S, but the no. 46 and no. 77R are also occasionally used.

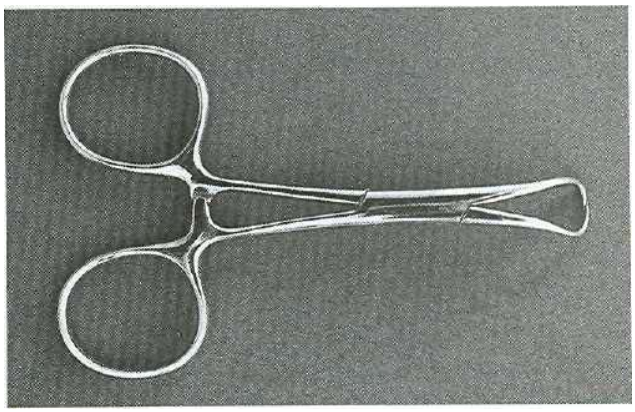


FIG. 6-33 Towel clip is used to hold drapes in position. Sharp points penetrate towels, and locking handles maintain drape in position. Towel clamps with nonpenetrating action are also available.

The shape of the biade of the straight elevator can be angled from the shank, allowing this instrument to be used in the more posterior aspects of the mouth. Two examples of the angled-shank elevator with a blade similar to the straight elevator are the Miller elevator and the Potts elevator.

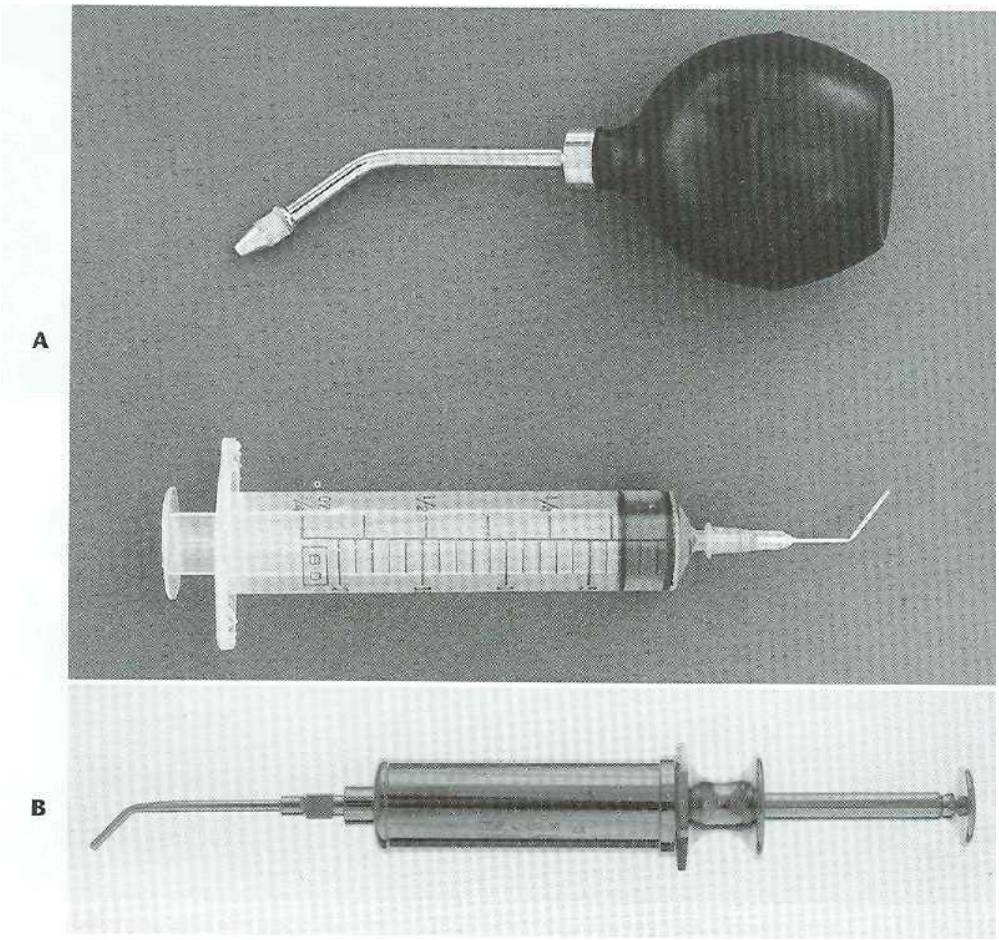


FIG. 6-34 A, Bulb or regular syringes may be used to carry irrigation solution to operative site. B, The self-ioaded syringe is spring-loaded to allow filling simply by releasing the plunger.

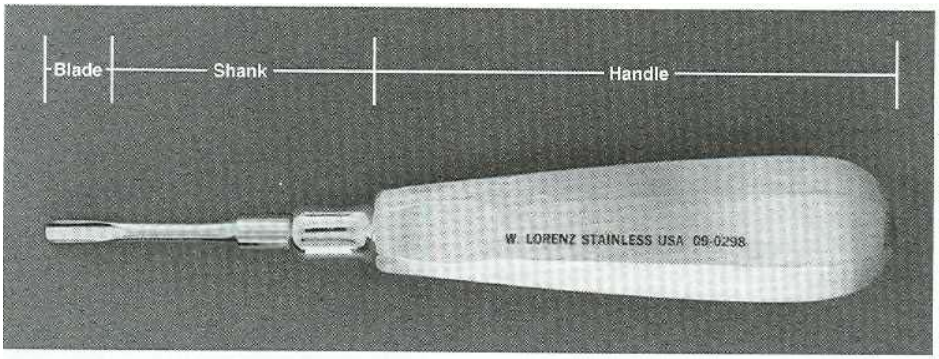


FIG. 6-35 The major components of an elevator are the handle, shank, and blade.

The second most commonly used elevator is the triangular or pennant-shaped elevator (Fig. 6-39). These elevators are provided in pairs: a left and a right. The triangle-shaped elevator is most useful when a broken root remains in the tooth socket and the adjacent socket is empty. A typical example would be when a mandibular first molar is fractured, leaving the distai root in the socket but the mesial root removed with the crown. The tip of the triangle-shaped elevator is placed into the socket, with the shank of the elevator resting on the buccal plate of bone. It is then turned in a wheel-and-axle type of rotation, with the sharp tip of the elevator engaging the cementum of the remaining distal root; the elevator is then turned and the root delivered. Triangle-shaped elevators come in a variety of types and angulations, but the Cryer is the most common type.

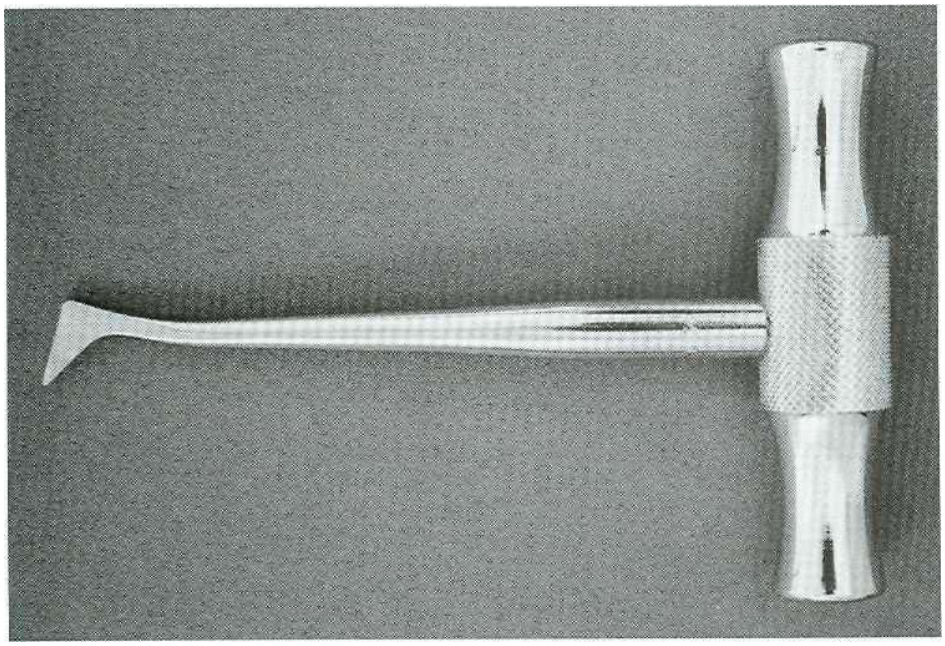


FIG. 6-36 Crossbar handle is used on certain elevators. This type of handle can generate large amounts of force and therefore must be used with caution.

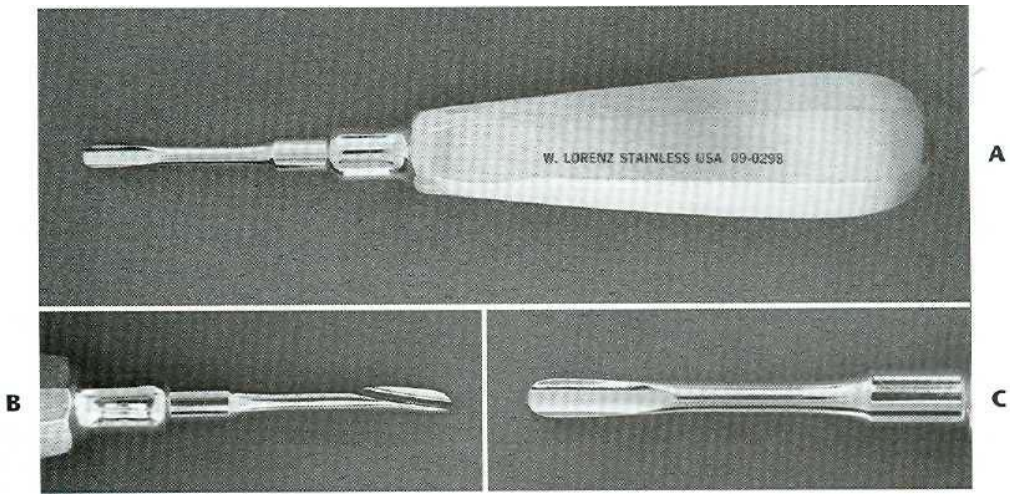


FIG. 6-37 A, Straight elevator is most commonly used elevator. B and C, Blade of straight elevator is concave on its working side.

The third type of elevator that is used with some frequency is the pick-type elevator. This type of elevator is used to remove roots. The heavy version of the pick is the Crane pick (Fig. 6-40). This instrument is used as a lever to elevate a broken root from the tooth socket. It is usually necessary to drill a hole with a bur, approximately 3 mm deep into the root. The tip of the pick is then inserted into the hole, and, with the buccal plate of bone as a fulcrum, the root is elevated from the tooth socket. Occasionally the sharp point can be used without preparing a purchase point by engaging the cementum of the tooth.

The second type of pick is the root tip pick, or apex elevator (Fig. 6-41). The root tip pick is a delicate instrument that is used to tease small root tips from their sockets. It must be emphasized that this is a thin instrument and cannot be used as a wheel-and-axle or lever type of elevator like the Cryer elevator or the Crane pick. The root tip pick is used to tease the very small root end of a tooth.

EXTRACTION FORCEPS

The instruments that come to mind when thinking of the removal of a tooth are the extraction forceps. These instruments are used for removing the tooth from the alveolar bone. They are designed in many styles and configurations to adapt to the variety of teeth for which they

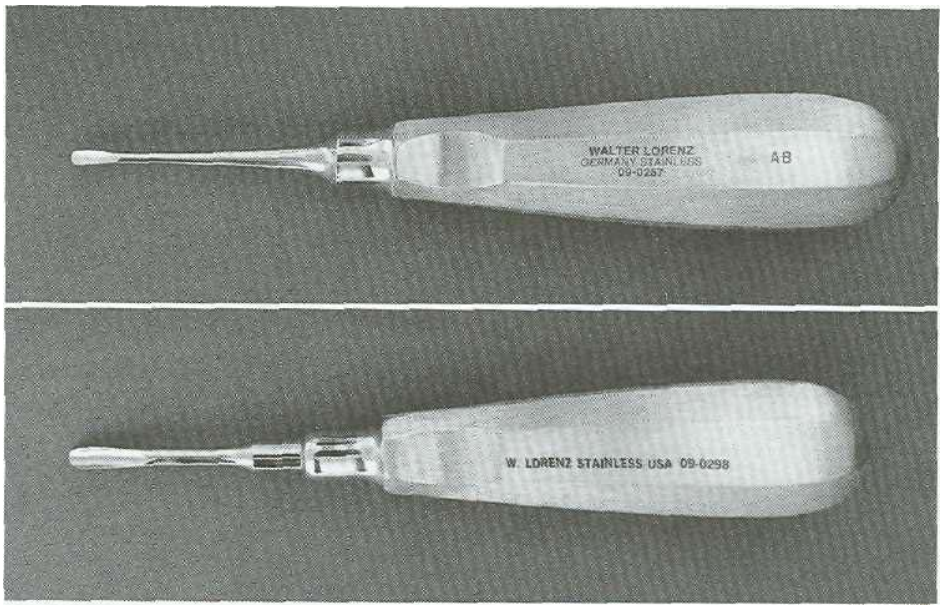


FIG. 6-38 Blade of small straight elevator is about half the width of a large straight elevator.

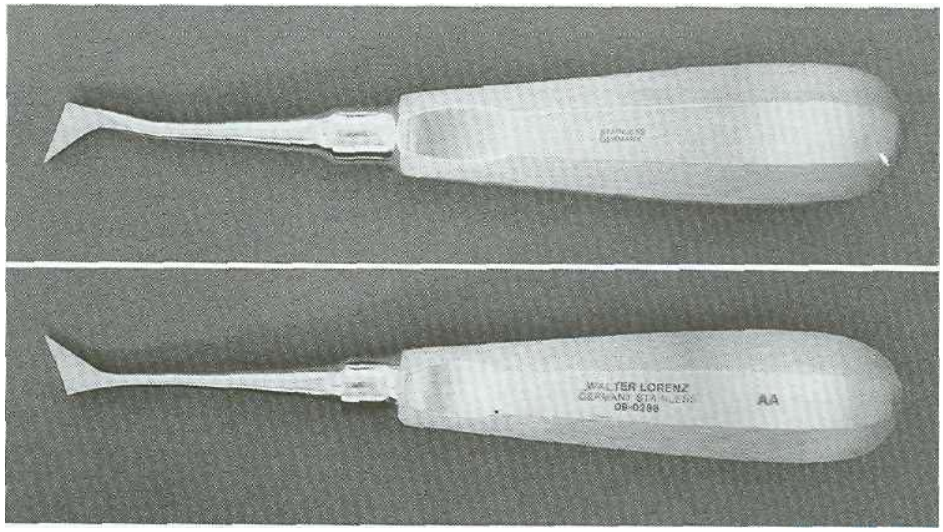


FIG. 6-39 Triangular-shaped elevators (Cryer) are pairs of instruments and are therefore used for specific roots.



FIG. 6-40 Crane pick is a heavy instrument used to elevate whole roots or even teeth after purchase point has been prepared with bur.

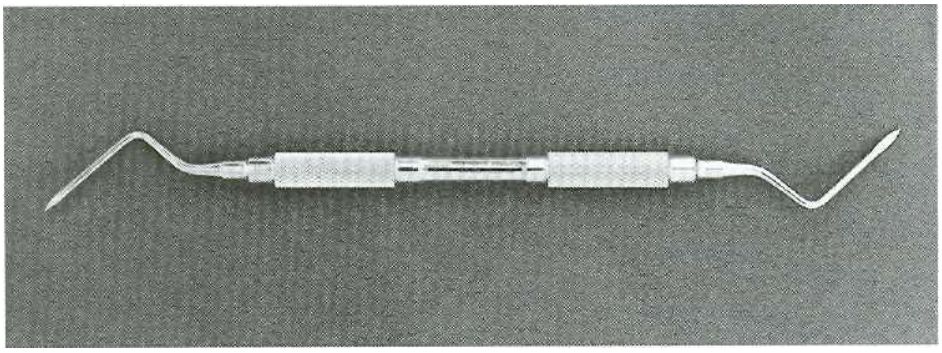


FIG. 6-41 Delicate root tip pick is used to tease small root tip fragments from socket.

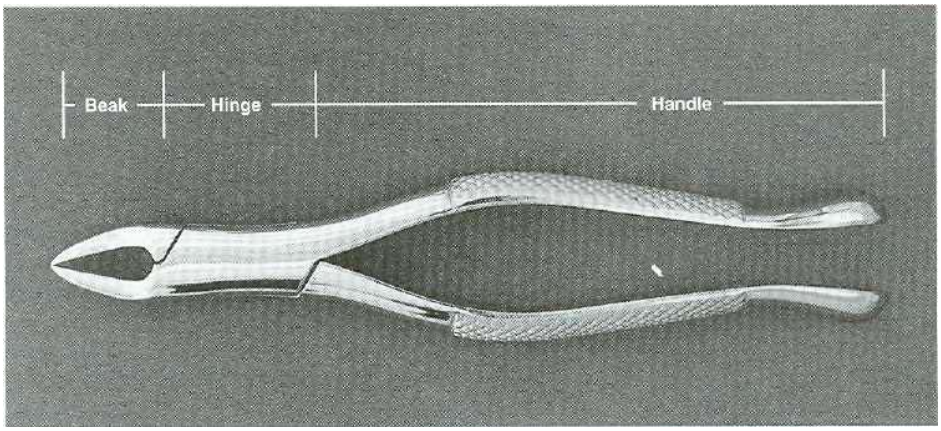


FIG. 6-42 Basic components of extraction forceps.

are used. Each basic design offers a multiplicity of variations to coincide with individual operator preferences. This section deals with the basic fundamental designs and touches on several of the variations.

Components

The basic components of dental extraction forceps are the handle, hinge, and beaks (Fig. 6-42). The handles are usually of adequate size to be handled comfortably and deliver sufficient pressure and leverage to remove the required tooth. The handles have a serrated surface to allow a positive grip and prevent slippage.

The handles of the forceps are held differently, depending on the position of the tooth to be removed. Maxillary forceps are held with the palm underneath the forceps so that the beak is directed in a superior direction (Fig. 6-43). The forceps used for removal of mandibular teeth are held with the palm on top of the forceps so that the beak is pointed down toward the teeth (Fig. 6-44). The handles of the forceps are usually straight but may be curved. This provides the operator with a sense of "better fit" (Fig. 6-45).

The hinge of the forceps, like the shank of the elevator, is mereiy a mechanism for connecting the handle to the beak. The hinge transfers and concentrates the force applied to the handles to the beak. One distinct difference in styles does exist: The usual American type of forceps has a hinge in a horizontal direction and is used as has been described (see Figs. 6-42 and 6-43). The English preference is for a vertical hinge and corresponding vertically positioned handle (Fig. 6-46, *A)*. Thus the English style handle and hinge are used with the hand held in a vertical direction as opposed to a horizontal direction (Fig. 6-46, *B)*.

The beaks of the extraction forceps are the source of the greatest variation among forceps. The beak is designed to adapt to the tooth root at the junction of the crown and root. It is important to remember that the beaks of the forceps are designed to be adapted to the *root structure* of the tooth and not to the crown of the tooth, in a sense then, different beaks are designed for single-rooted teeth, two-rooted teeth, and three-rooted teeth. The design variation is such that the tips of the beaks will adapt closely to the various root formations, decreasing the chance for root fracture. The more closely the beak of the forceps adapts to the tooth roots, the more efficient will be the extraction and the less chance for untoward complications.

A final design variation is in the width of the beak. Some forceps are narrow, because their primary use is to remove narrow teeth, such as incisor teeth. Other forceps are somewhat broader, because the teeth they are designed to remove are substantially wider, such as lower molar teeth. Forceps designed to remove a lower incisor

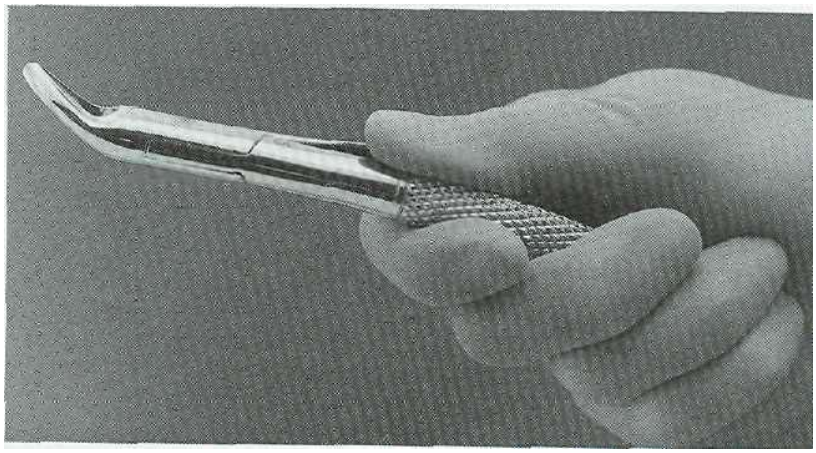


FIG. 6-43 Forceps used to remove maxillary teeth are held with palm under handle.

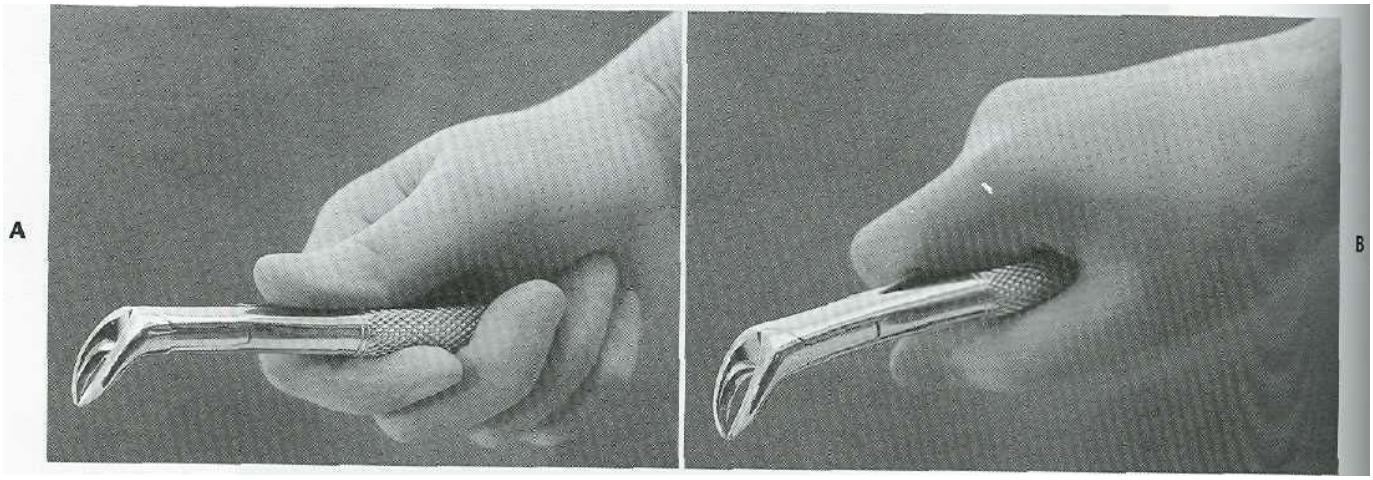


FIG. 6-44 A, Forceps used to remove mandibular teeth are held with palm on top of forceps. B, Firmer grip for delivering greater amounts of rotational force can be achieved by moving thumb around and under handle.

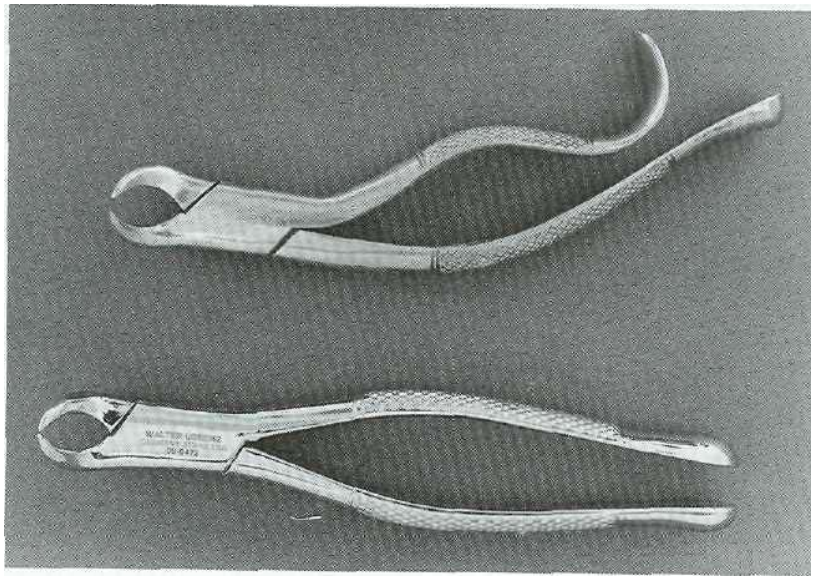


FIG. 6-45 Straight handles are usually preferred, but curved handles are preferred by some surgeons.

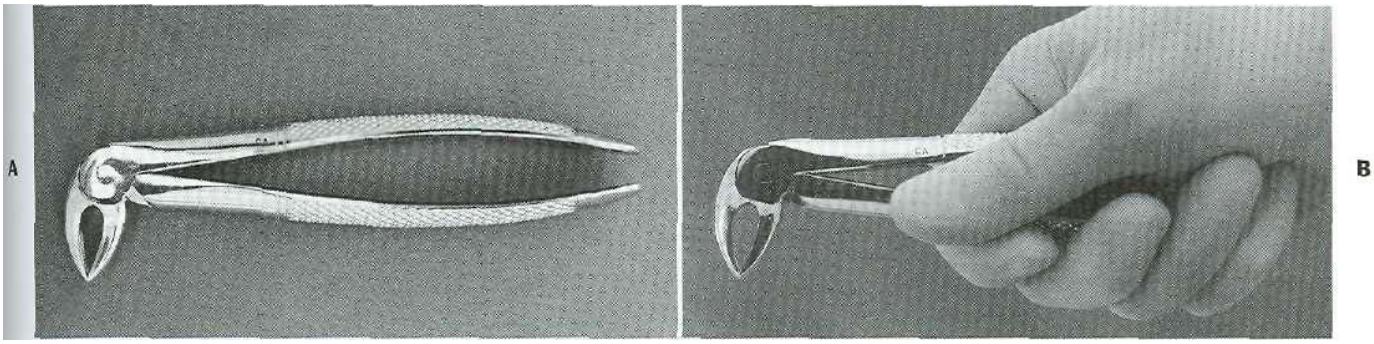


FIG. 6-46 A, English style of forceps have hinge in vertical direction. B, English style of forceps are held in vertical direction.

can be used to remove a lower molar, but the beaks are so narrow that they will be inefficient for that application. Similarly the broader molar forceps would not adapt to the narrow space allowed by the narrow lower incisor and therefore could not be used in that situation.

The beaks of the forceps are angled so that they can be placed parallel to the long axis of the tooth, with the handle in a comfortable position. Therefore the beaks of maxillary forceps are usually parallel to the handles. Maxillary molar forceps are offset in a bayonet fashion to allow the operator to comfortably reach the posterior aspect of the mouth and yet keep the beaks parallel to the long axis of the tooth. The beak of mandibular forceps is usually set perpendicular to the handles, which allows the surgeon to reach the lower teeth and maintain a comfortable, controlled position.

Maxillary Forceps

The removal of maxillary teeth requires the use of instruments designed for single-rooted teeth and for teeth with three roots. The maxillary incisors, canine teeth, and premolar teeth are all considered to be single-rooted teeth. The maxillary first premolar frequently has a bifurcated root, but because this occurs in the apical one third, it has no influence on the design of the forceps. The maxillary molars are usually trifurcated and therefore require extraction forceps, which will adapt to that configuration.

The single-rooted maxillary teeth are usually removed with maxillary universal forceps, usually no. 150 (Fig. 6-47). The no. 150 forceps are slightly curved when viewed from the side and are essentially straight when viewed from above. The beaks of the forceps curve to meet only at the tip. The slight curve of the no. 150 allows the operator to reach not only the incisors, but also the bicuspids in a comfortable fashion. The beak of the no. 150 forceps has been modified slightly to form the no. 150A forceps (Fig. 6-48). The no. 150A is useful for the maxillary premolar teeth and should not be used for the incisors, because their adaptation to the roots of the incisors is poor.

In addition to the no. 150 forceps, straight forceps are also available. The no. 1 (Fig. 6-49), which can be used for maxillary incisors and canines, are slightly easier to use than the no. 150 for incisors.

The maxillary molar teeth are three-rooted teeth with a single palatal root and a buccal bifurcation. Therefore forceps that are adapted to fit the maxillary molars must have a smooth, concave surface for the palatal root and a beak with a pointed design that will fit into the buccal bifurcation on the buccal beak. This requires that the molar forceps come in pairs: a left and a right. Additionally, the molar forceps should be offset so that the operator can reach the posterior aspect of the mouth and remain in the correct position. The most commonly used molar forceps are the no. 53 right and left (Fig. 6-50). These forceps are designed to fit anatomically around the palatal beak, and the pointed buccal beak fits into the buccal bifurcation. The beak is offset to allow for good positioning.

A design variation is shown in the no. 88 right and left forceps, which have a longer, more accentuated, pointed beak formation (Fig. 6-51). These forceps are known as upper cowhorn forceps. They are particularly useful for maxillary molars whose crowns are severely decayed. The sharply pointed beaks may reach deeper into the trifurcation to sound dentin. The major disadvantage is that they crush alveolar bone, and when used on intact teeth without due caution, fracture of large amounts of buccal alveolar bone may occur.

On occasion, maxillary second molars and erupted third molars have a single conically shaped root. In this situation, forceps with broad, smooth beaks that are offset from the handle can be useful. The no. 210S forceps exemplify this design (Fig. 6-52). Another design variation is shown in the offset molar forceps with very narrow beaks. These are used primarily to remove broken maxillary molar roots but can be used for removal of narrow premolars and for lower incisors. These forceps, the no. 286, are also known as root tip forceps (Fig. 6-53).

A smaller version of the no. 150, the no. 150S, is useful for removing primary teeth (Fig. 6-54). These adapt well to all maxillary primary teeth and can be used as universal primary tooth forceps.

Mandibular Forceps

Extraction of mandibular teeth requires forceps that can be used for single-rooted teeth for the incisors, canines, and premolars, as well as for two-rooted teeth for the molars. The forceps most commonly used for the single-rooted teeth are the lower universal forceps, or the no. 151 (Fig.

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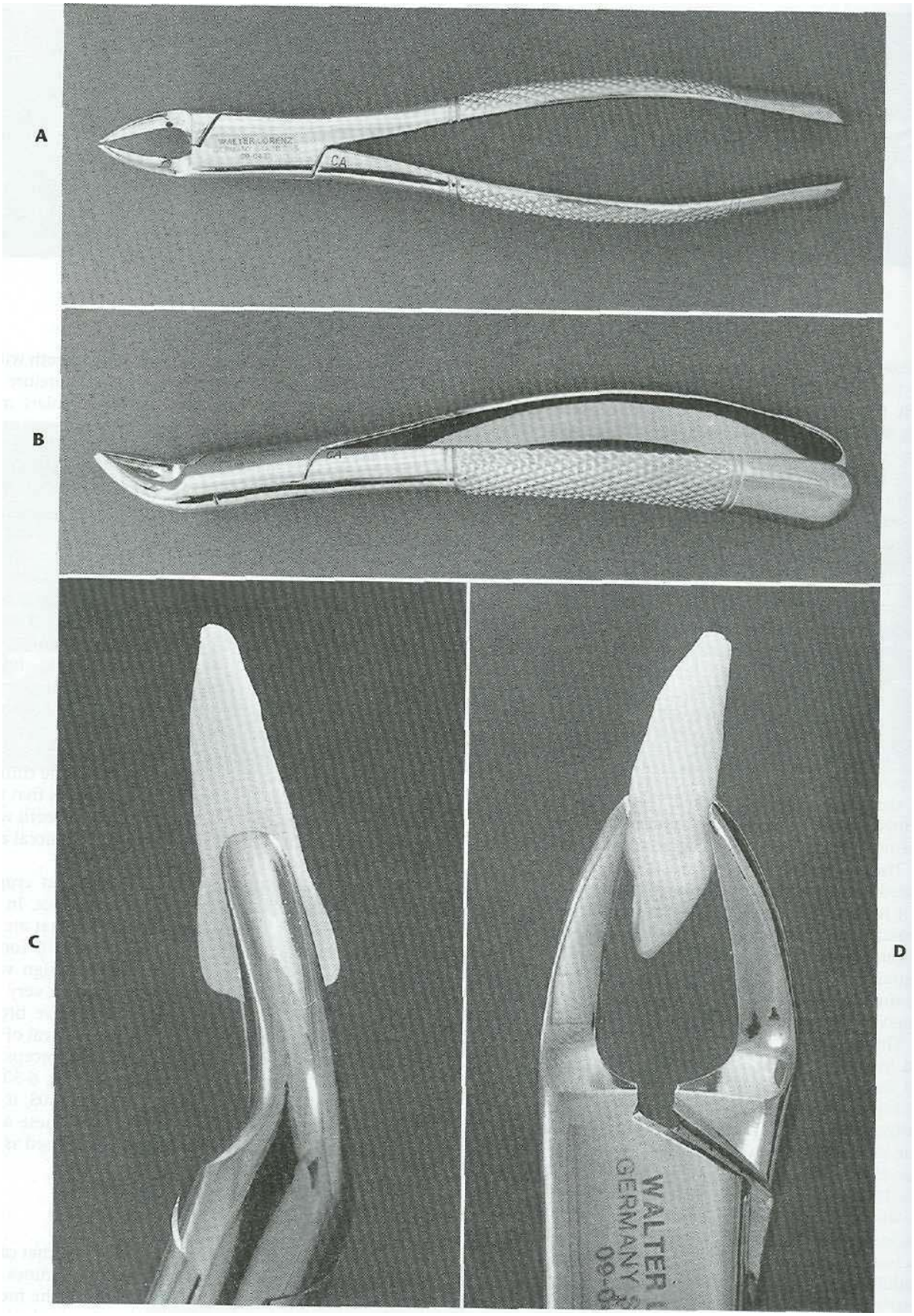


FIG. 6-47 A, Superior view of no. 150 forceps. B, Side view of no. **150** forceps. C and D, No. **150** forceps adapted to maxillary central incisor.

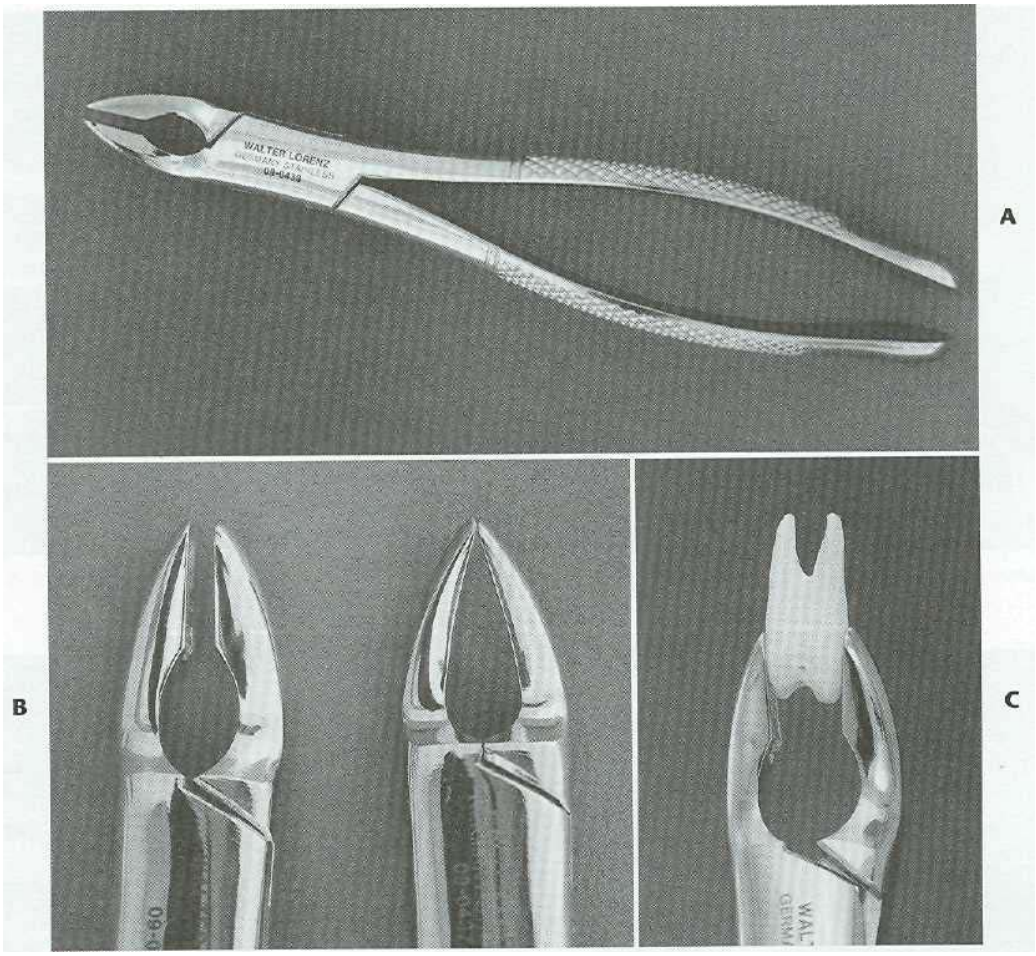


FIG. 6-48 A, Superior view of no. 150A forceps. B, No. 150A forceps have parallel beaks that do not touch in distinction from 1 50 forceps beak. C, Adaptation of no. 150A forceps to maxillary premolar.

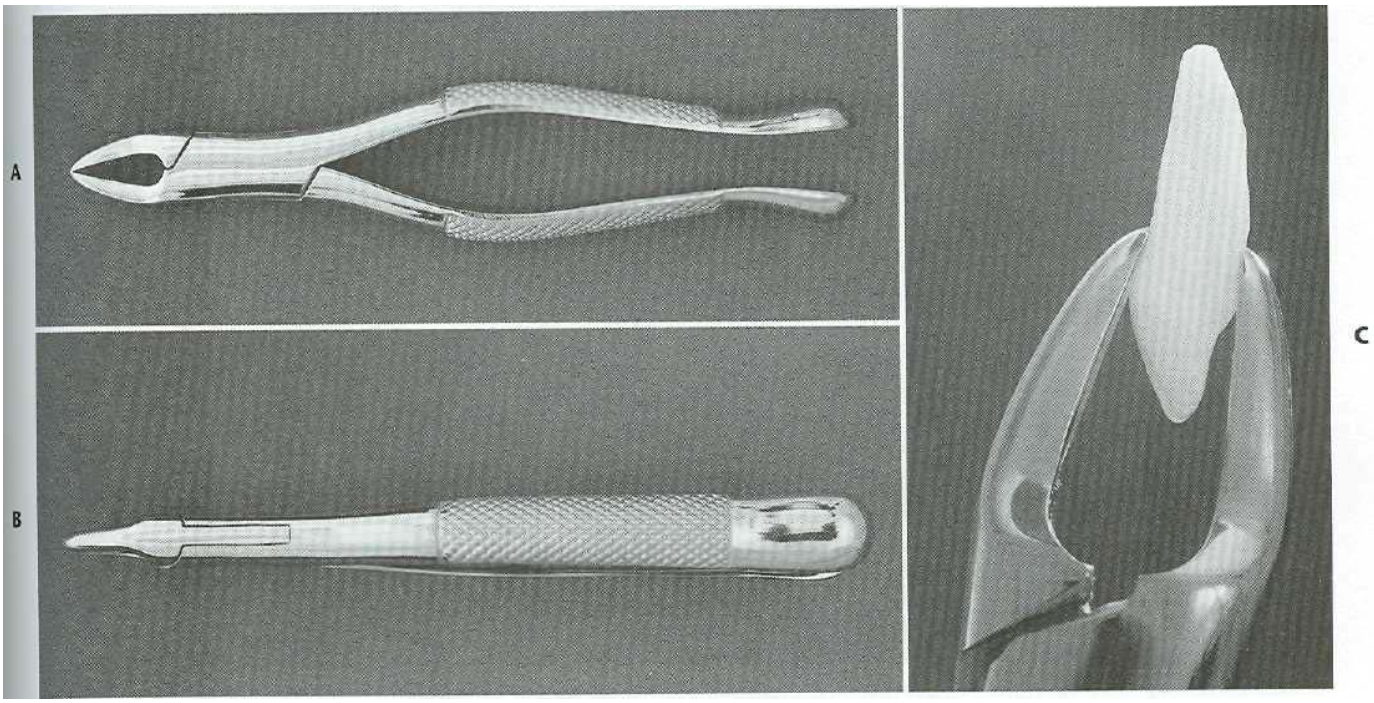


FIG. 6-49 A, Superior view of the no. 1 forceps. B, Side view of the no. 1 forceps. C, No. 1 forceps adapted to incisor.

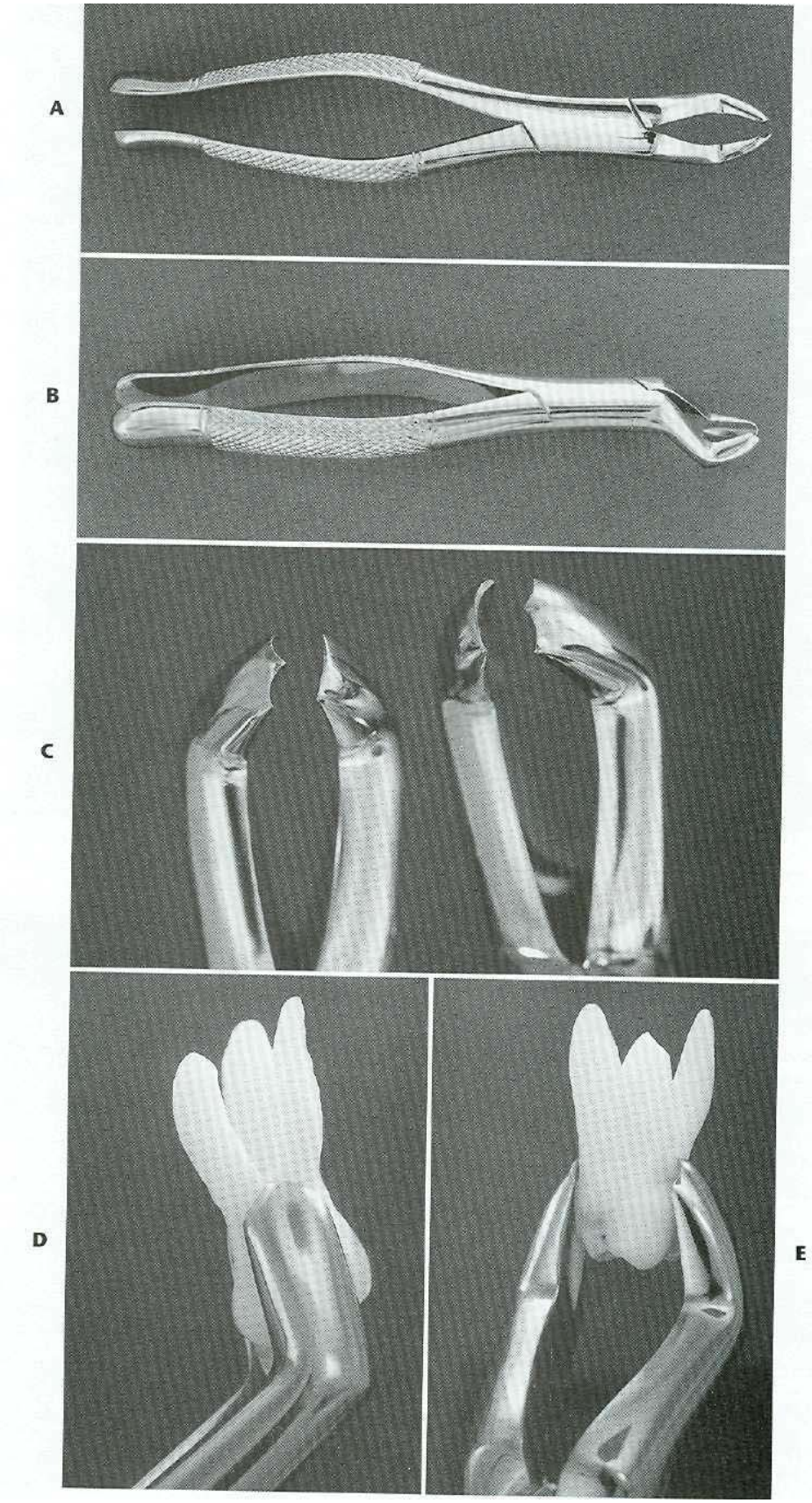


FIG. 6-50 A, Superior view of the no. 53L forceps. B, Side view of no. 53L forceps. C, Right, No. 53L; left, no. 53R. D and E, No. *531* adapted to maxillary molar.

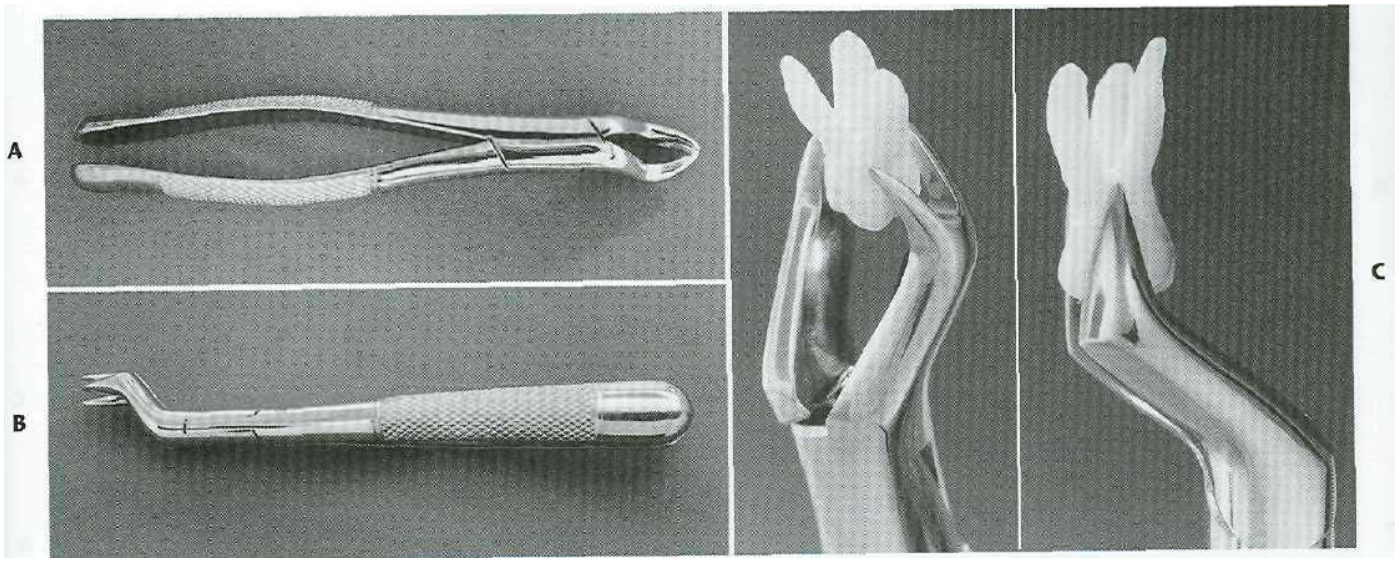


FIG. 6-51 A, Superior view of no. 88L forceps, B, Side view of no. 88L forceps. C, No. 88R adapted to maxillary molar.

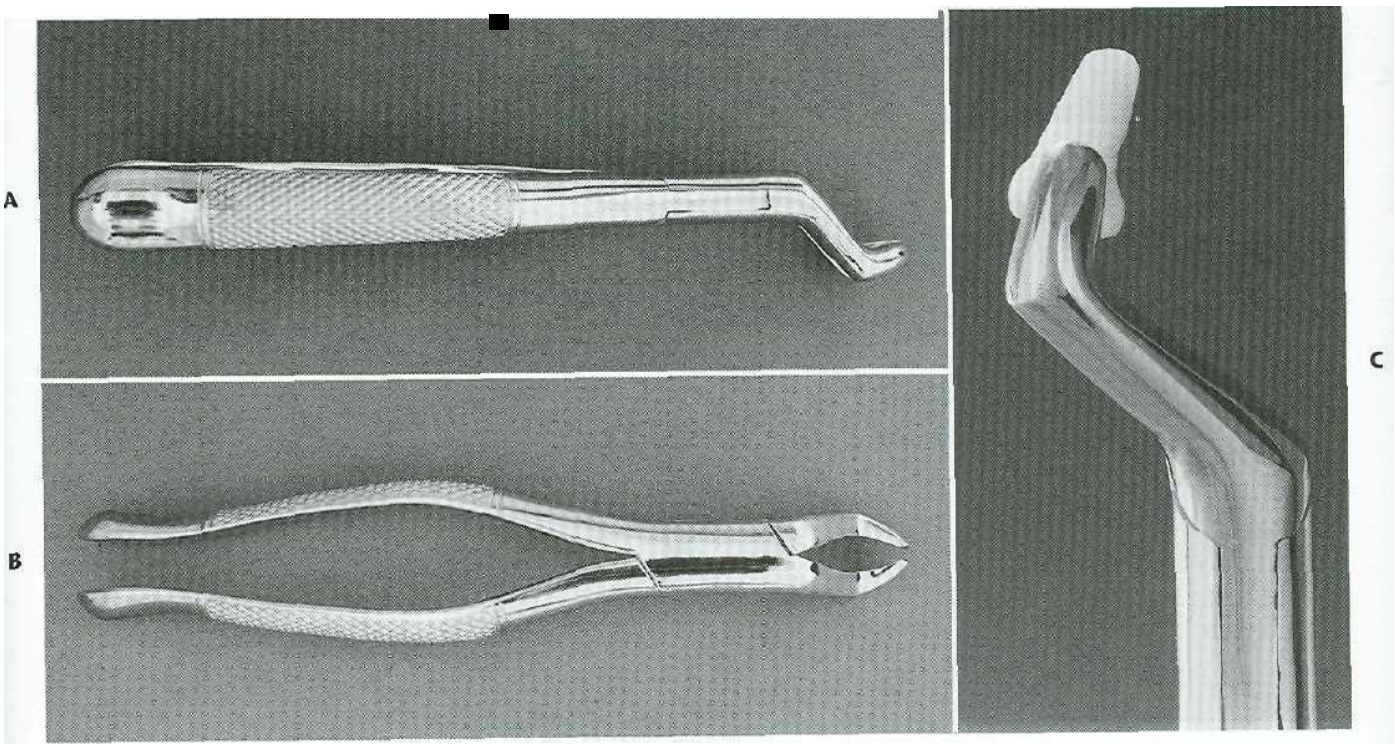


FIG. 6-52 A, Superior view of no. 21 OS forceps. B, Side view of no. 21 OS forceps. C, No. 21 OS adapted to maxillary molar.

6-55). These have handles similar in shape to the no. 150, but the beaks are pointed inferiorly for the lower teeth. The beaks are smooth and relatively narrow and meet only at the tip. This allows the beaks to fit at the cervical line of the tooth and grasp the root.

The no. 151A forceps have been modified slightly for mandibular premolar teeth (Fig. 6-56). They should not be used for other lower teeth, because their form prevents adaptation to the roots of the teeth.

The English style of vertical-hinge forceps is used occasionally for the single-rooted teeth in the mandible (Fig. 6-57). Great force can be generated with these forceps; unless care is used, the incidence of root fracture is high with this instrument. Therefore it is rarely used by the beginning surgeon.

The mandibular molars are bifurcated, two-rooted teeth that allow the use of forceps that anatomically adapt to the tooth. Because the bifurcation is on both the buccal and the lingual sides, only single molar forceps are necessary for the left and right, in contradistinction to the maxilla, with which a right- and left-paired molar forceps set is required.

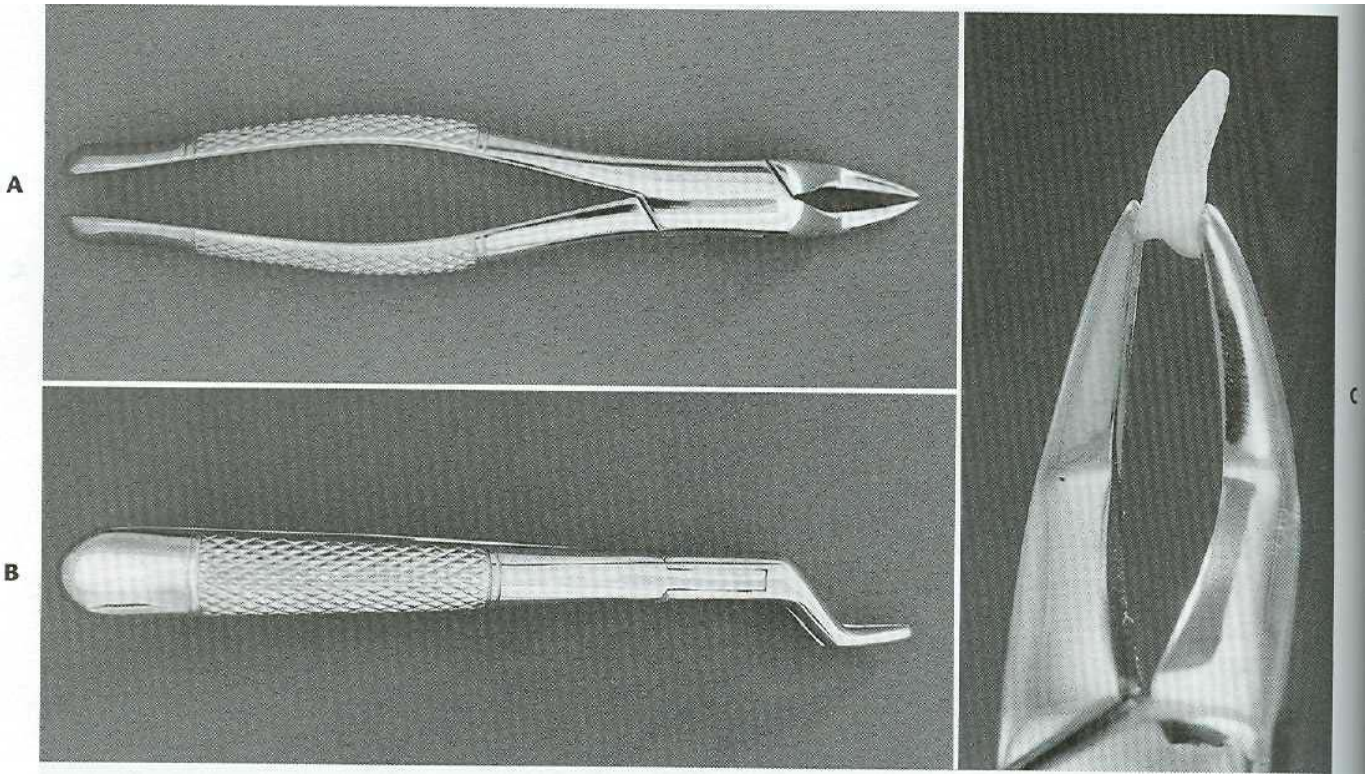


FIG.6-53 A, Superior view of no. 286 forceps. B, Side view of no. 286 forceps. C, No. 286 adapted to broken root.

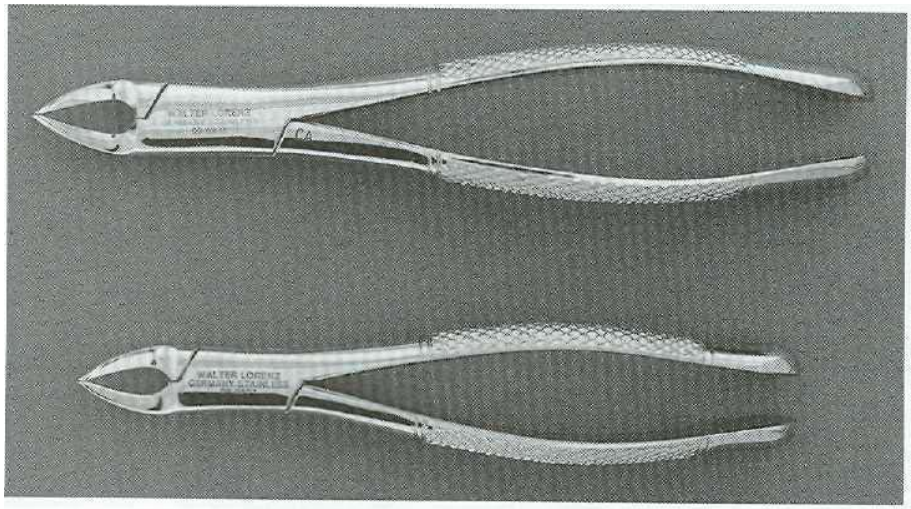
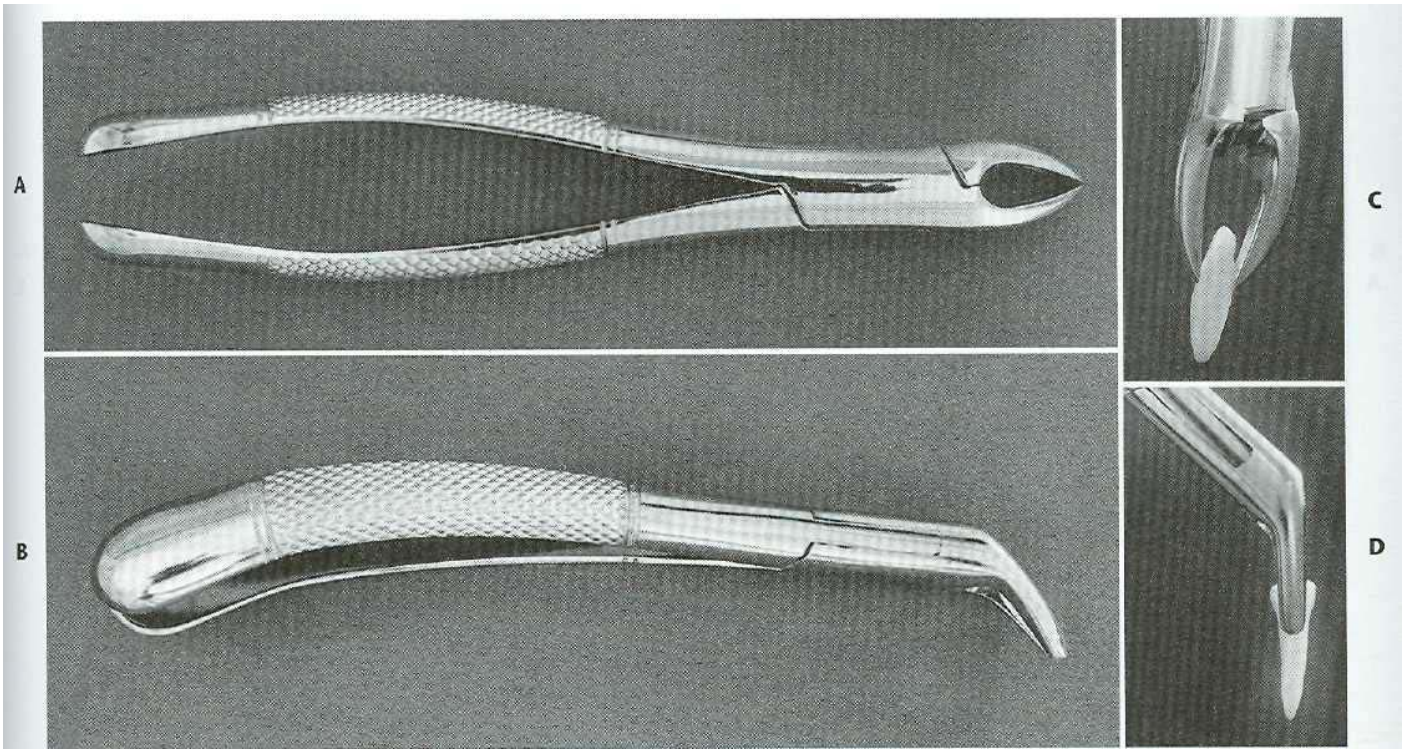


FIG. 6-54 No. 150S *(bottom)* is smaller version of no. 1 50 forceps *(top)* and is used for primary teeth.

The most useful lower molar forceps are the no. 17 (Fig. 6-58). These forceps are usually straight-handled, and the beaks are set obliquely downward. The beaks have bilateral pointed tips in the center to adapt into the bifurcation of the molar teeth. The remainder of the beak adapts well to the bifurcation. Because of the pointed tips, the no. 17 forceps cannot be used for molar teeth, which have fused, conically shaped roots. For this purpose the no. 222 forceps are useful (Fig. 6-59). They are similar in design to the no. 17, but the beaks are shorter and do not have pointed tips to prevent them from being used. The most common tooth for which the no. 222 is useful is the erupted mandibular third molar.

The major design variation in lower molar forceps is the no. 23, the so-called cowhorn forceps (Fig. 6-60). These instruments are designed with two pointed heavy beaks that enter into the bifurcation of the lower molar. After the forceps are seated into the correct position, the tooth is elevated by squeezing the handles of the forceps together tightly. The beaks are squeezed into the bifurcation, using the buccal and lingual cortical plates as ful-



FIC. 6-55 A, Superior view of no. 151 forceps. B, Side view of no. 151 forceps. C and D, No. 151 forceps adapted to mandibular incisor.

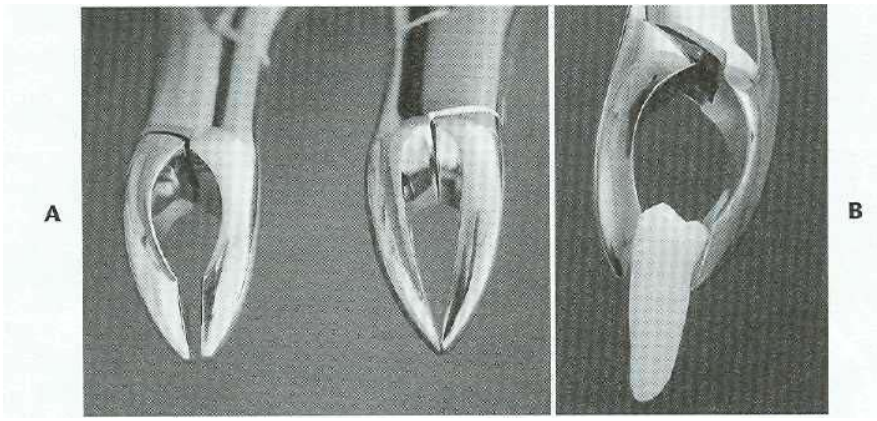


FIG. 6-56 A, No. 151A forceps have beaks that jre parallel and do not adapt well to roots of most teeth in contradistinction to the no. 151 forceps beaks. B, No. 151A forceps adapted to a lower premolar tooth. The lack of close adaptation of tips of beak to root of tooth is visualized.

crums, and the tooth is literally squeezed out of the socket. As with the English style of forceps, improper use of cowhorn forceps can result in an increase in the incidence of untoward effects, such as fractures of the alveolar bone. The beginning surgeon should use cowhorn forceps with caution.

The no. 151 is also adapted for primary teeth. The no. 151S is the same general design as the no. 151 but is scaled down to adapt to the primary teeth. A single pair of forceps is adequate for removal of all primary mandibular teeth (Fig. 6-61).

INSTRUMENT TRAY SYSTEMS

Many surgeons find it practical to use the "tray" method to assemble instruments. Standard sets of instruments are packaged together, sterilized, and unwrapped at surgery. The typical basic extraction pack includes a local anesthesia syringe, a needle, a local anesthesia cartridge, a Woodson elevator, a periapical curette, a small and large straight elevator, a pair of college pliers, a curved hemostat, a towel clip, an Austin retractor, a suction, and gauze (Fig. 6-62). The required forceps would be added to this tray.

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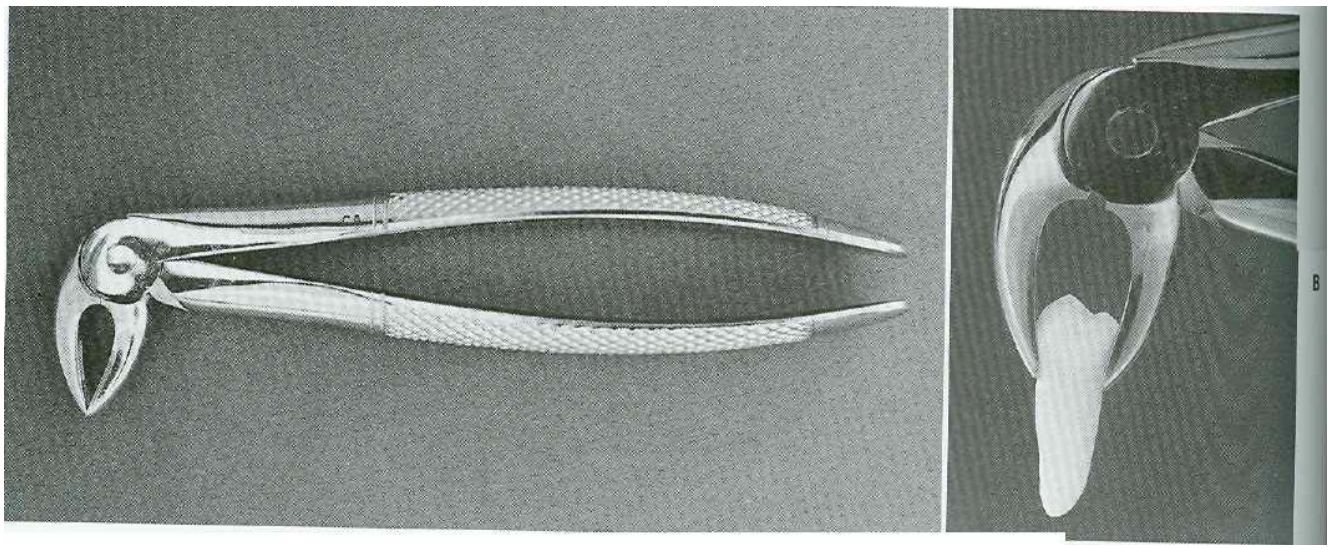


FIG. 6-57 A, Side view of English style of forceps. B, Forceps adapted to lower premolar

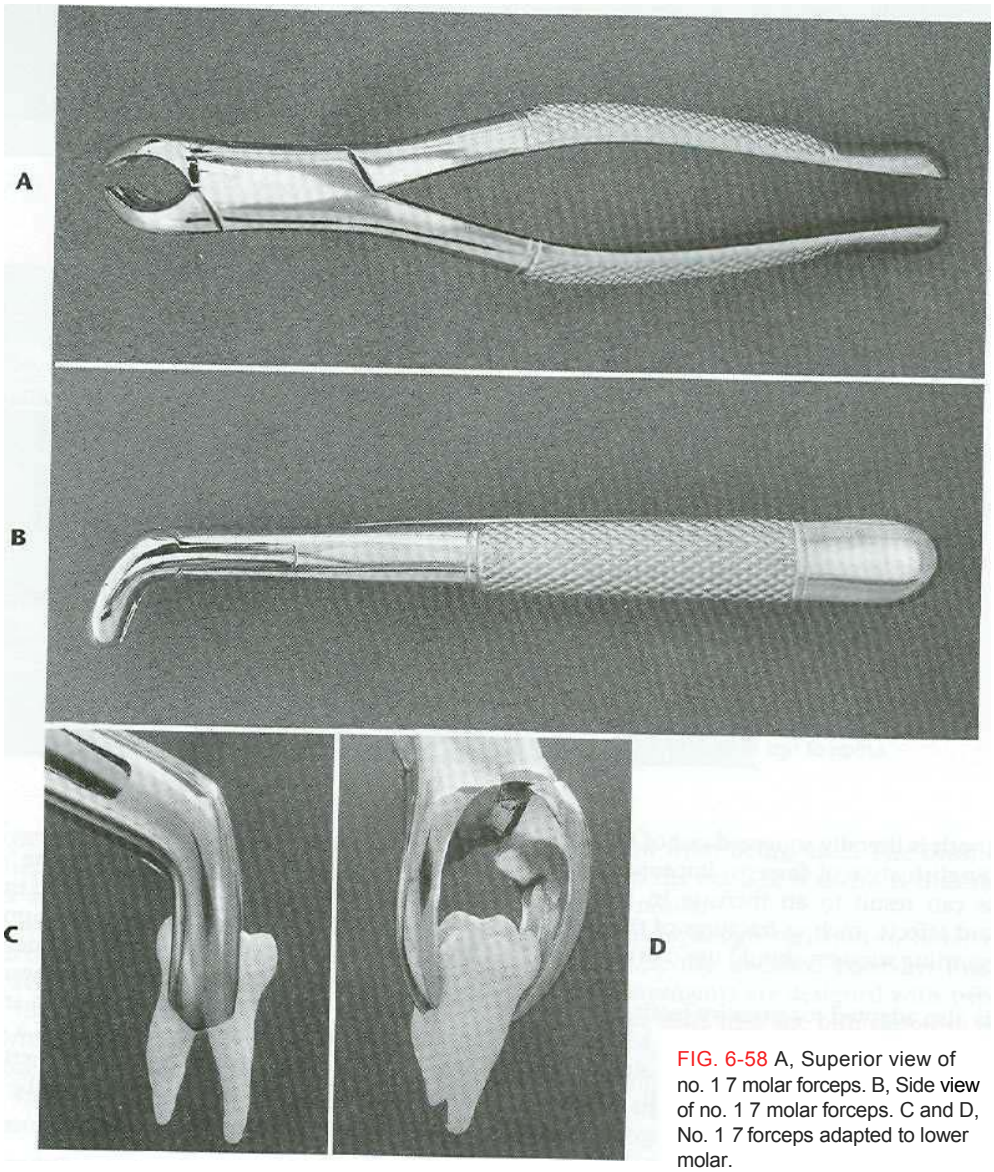


FIG. 6-58 A, Superior view of no. 1 7 molar forceps. B, Side view of no. 1 7 molar forceps. C and D, No. 1 7 forceps adapted to lower molar.

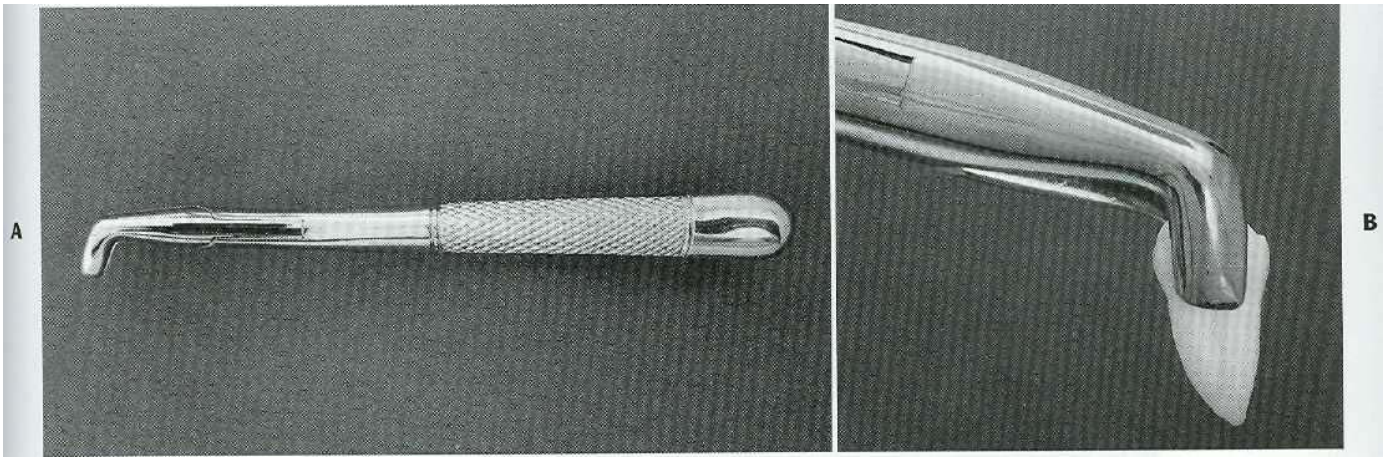


FIG. 6-59 A, Side view of no. 222 forceps. B, No. 222 forceps adapted to lower third molar.

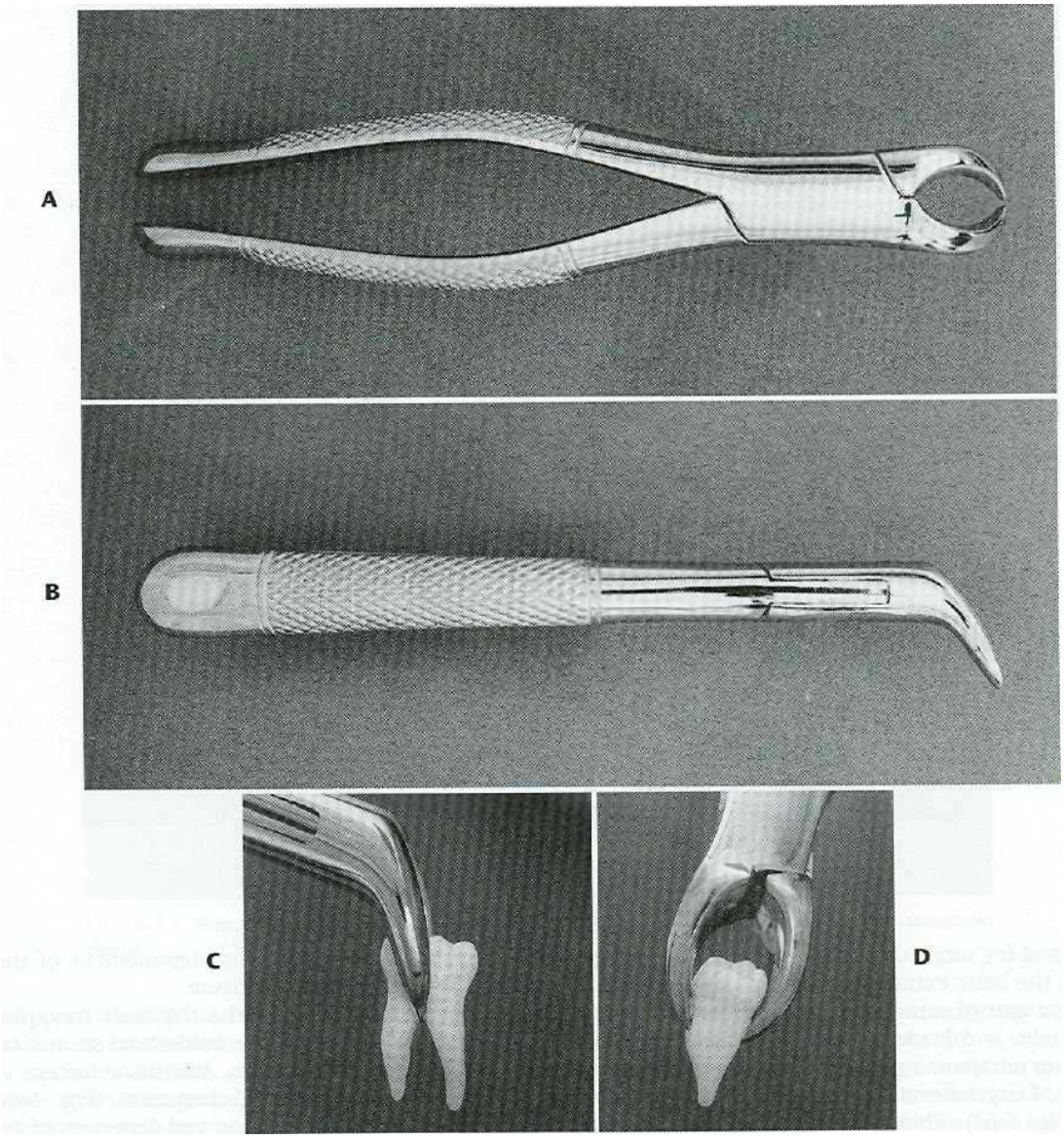


FIG. 6-60 A, Superior view of cowhorn no. 23 forceps. B, Side view of cowhorn forceps. C and D, Cowhorn forceps adapted to lower molar tooth.

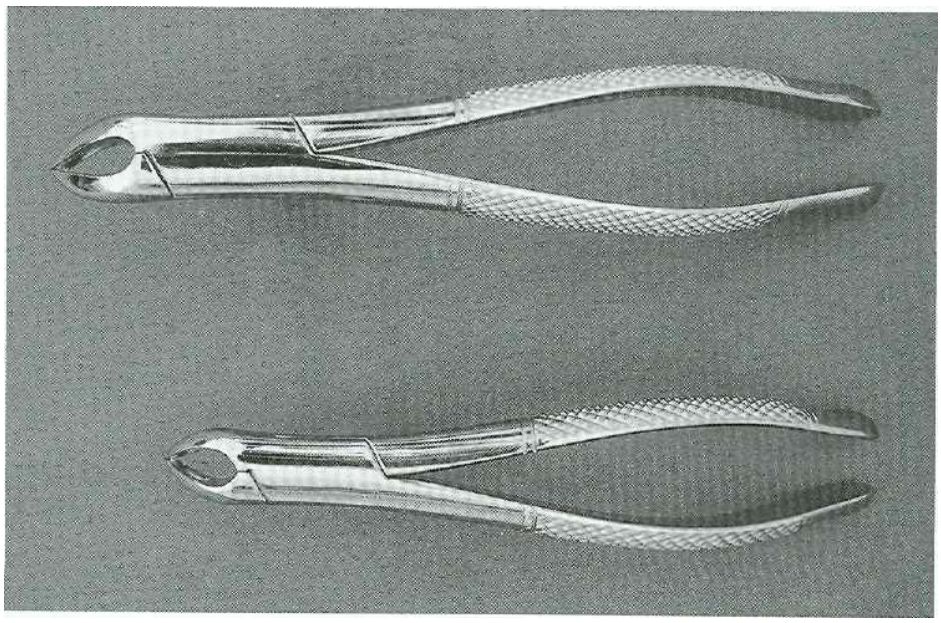


FIG. 6-61 No. 151S *(bottom)* is the smaller version of no. 151 (top,) and is used to extract primary teeth.

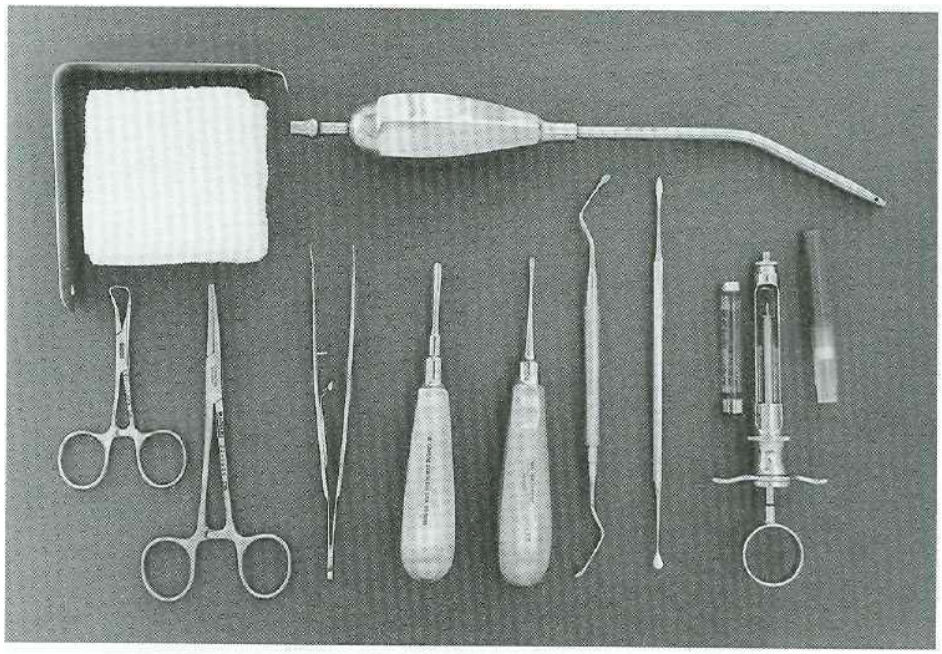


FIG. 6-62 Typical basic extraction tray.

A tray used for surgical extractions would include the items from the basic extraction tray plus a needle holder and suture, a pair of suture scissors, a periosteal elevator, a blade handle and blade, Adson tissue forceps, a bone file, a tongue retractor, a root tip pick, Russian tissue forceps, a pair of Cryer elevators, a rongeur, and a handpiece and bur (Fig. 6-63). These instruments permit incision and reflection of soft tissue, removal of bone, sectioning of teeth, retrieval of roots, debridement of the wound, and suturing of the soft tissue.

The biopsy tray includes the basic tray, plus a blade handle and blade, needle holder and suture, suture scissors, Metzenbaum scissors, Allis tissue forceps, Adson tissue forceps, and curved hemostat (Fig. 6-64). These instruments permit incision and dissection of a soft tissue specimen and closure of the wound with sutures.

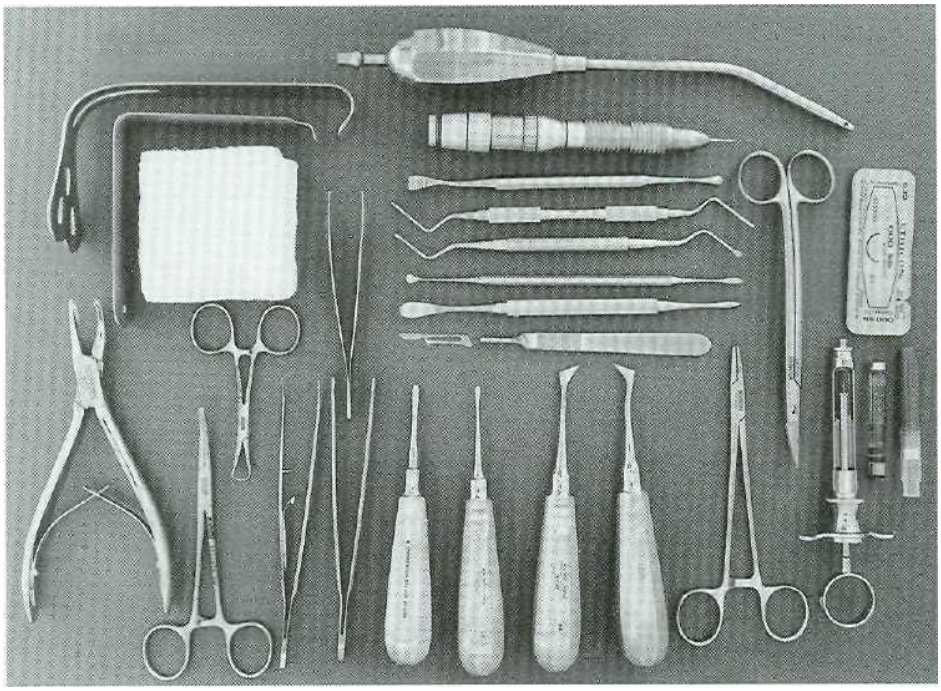


FIG. 6-63 Surgical extraction tray adds necessary instrumentation to reflect soft tissue flaps, remove bone, section teeth, retrieve roots, and suture flaps back into position.

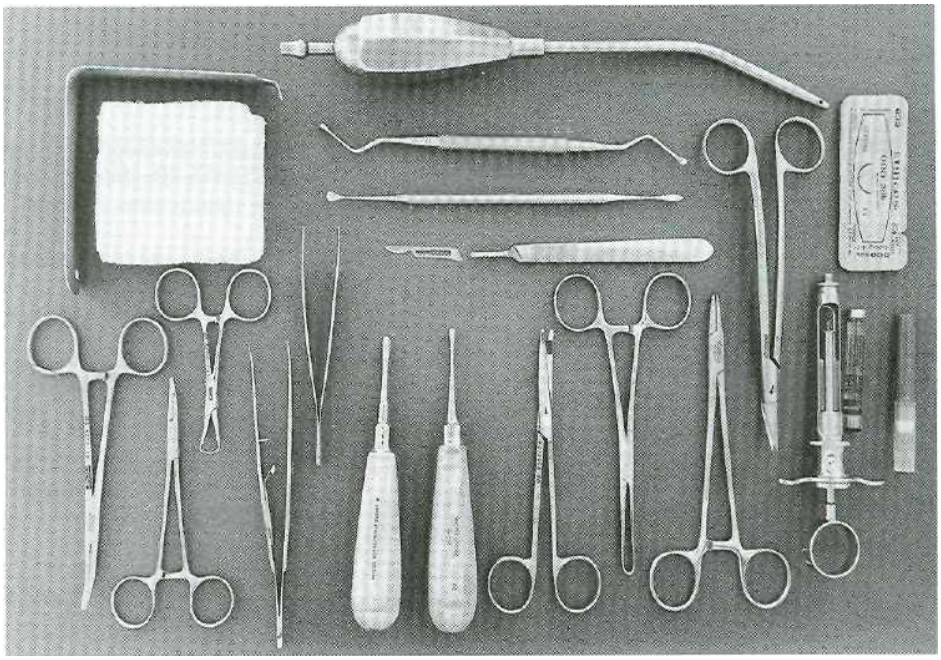


FIG. 6-64 Biopsy tray adds equipment necessary to remove soft tissue specimen and suture wound closed.

The postoperative tray has the necessary instruments to irrigate the surgical site and remove sutures (Fig. 6-65). It usually includes scissors, college pliers, irrigation syringe, applicator sticks, gauze, and suction.

The instruments may be placed on a flat tray, wrapped with sterilization paper, and sterilized. When ready for use, the tray is taken to the operatory, opened, and the instruments used from the tray. This system requires a rather large autoclave to accommodate the tray.

Alternately, metal cassettes can be used instead of a tray. They are more compact but must also be wrapped in sterilization paper (see Fig. 5-6).

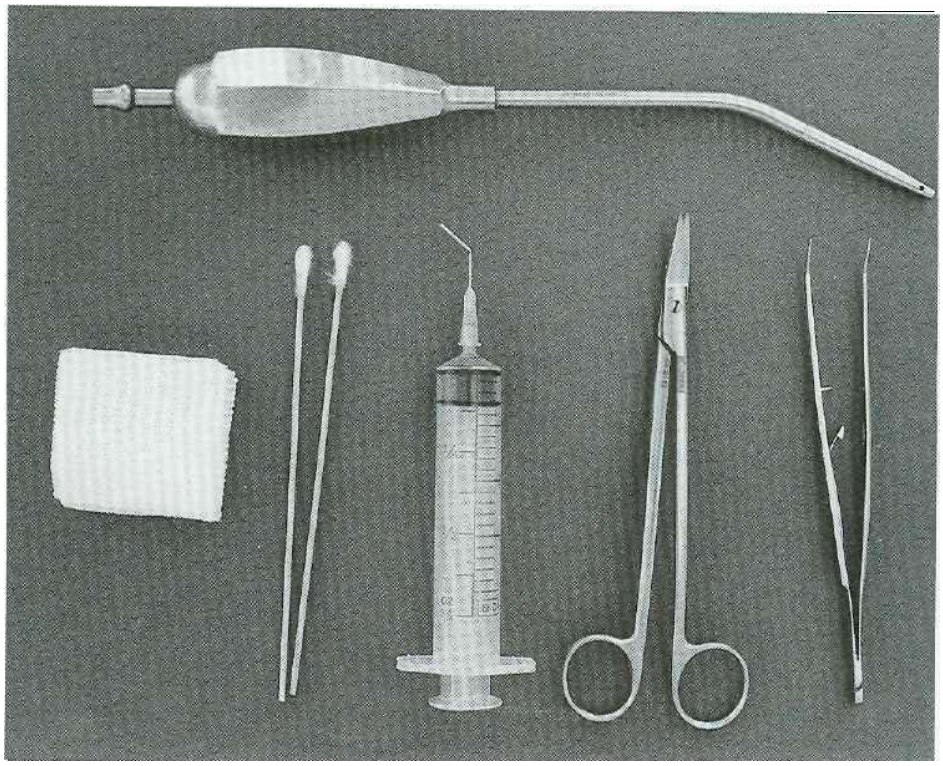


FIG. 6-65 Postoperative tray includes instruments necessary to remove sutures and irrigate mouth.

The appendix includes prices for the instruments listed for these trays. A casual review of the cost of the surgical instruments will reflect why the surgeon and staff should make every effort to take good care of instruments.

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