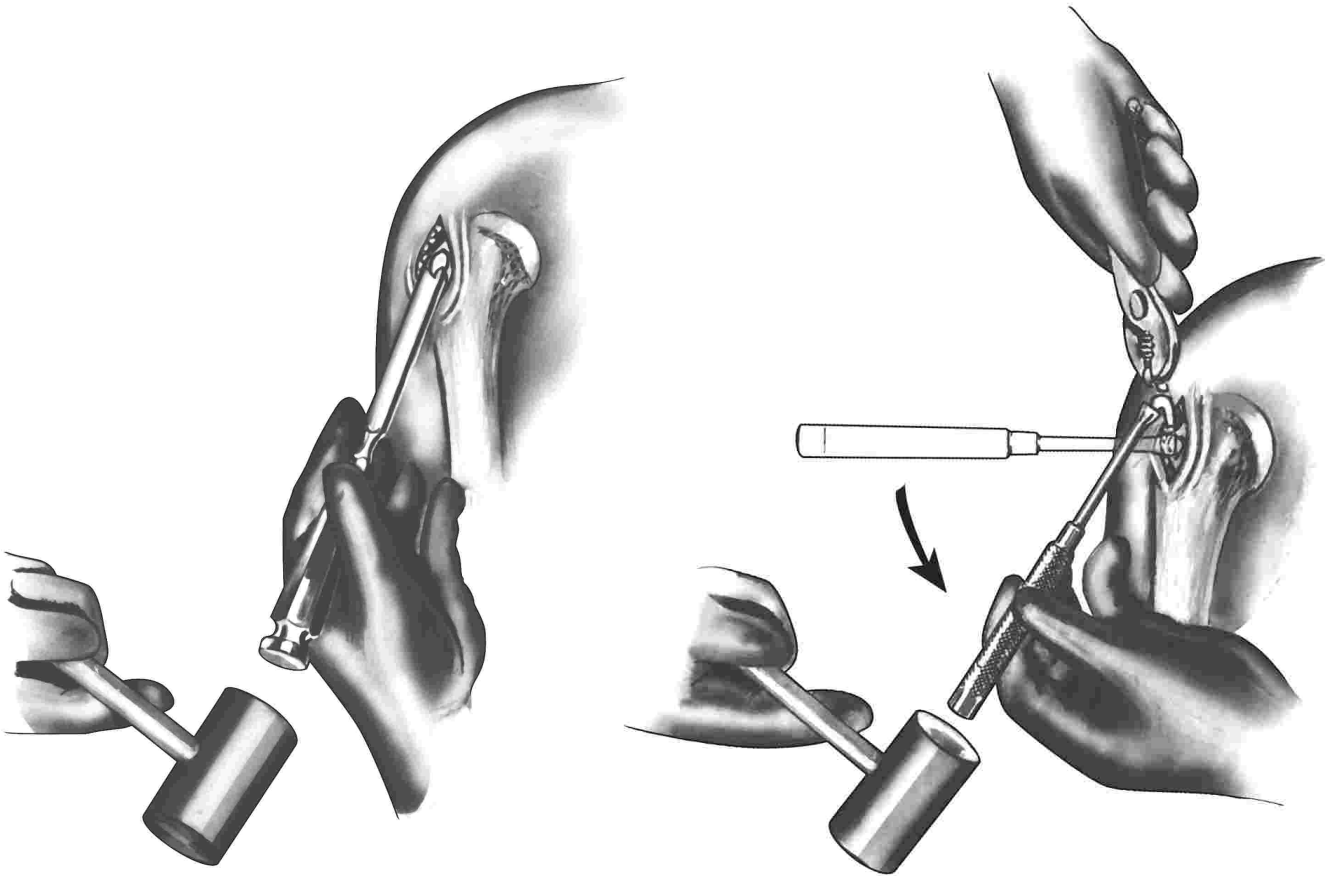


5 EXTRACTION



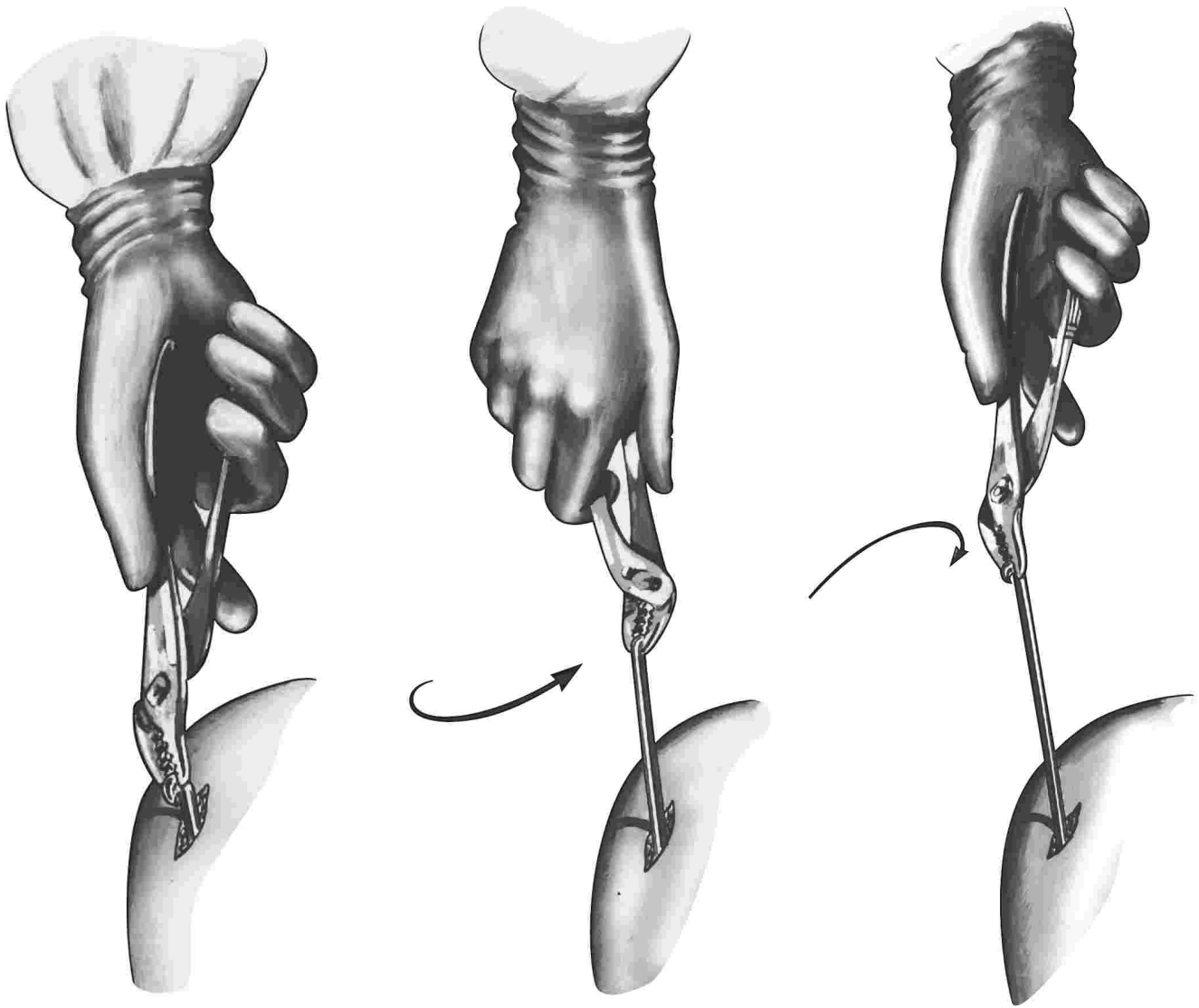
To Loosen the Head

A bone-gouging chisel may be used if a driver-extractor is not available. Slip the chisel beneath the hook of the head and tap with a mallet until the head rides sufficiently free so that it can be grasped with a pair of pliers.

With the driver-extractor, observe that it has an elliptical cup-shaped extremity which fits over the head of the pin. This can be used just as the gouging chisel. This instrument is slipped beneath the hook and tapped with a mallet until

the head is freed from the bone and can be grasped with a pair of pliers.

In the event that the head is buried into the bone, place the extractor at a right angle to the bone overlying the head and tap with a mallet. This makes an elliptical cut in the bone which usually frees the hook so that the instrument can be gotten beneath it for the maneuver. In removing large pins the pin extractor previously shown is useful.



Twist Out

In addition to the driver-extractor, a pair of pliers is an excellent instrument for removal of the pin. Withdraw the pin by grasping it with a pair of pliers, rotating the pin back and forth on its long axis. This greatly facilitates the procedure. It is rarely difficult to remove a pin in this manner once the head has been located. The pliers should have serrated jaws to prevent slipping.

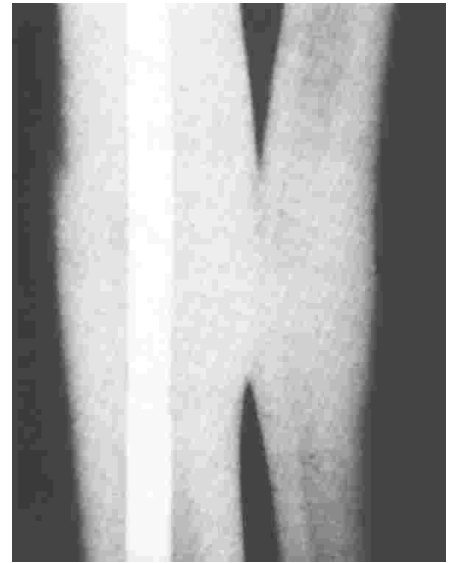
It has been found extremely difficult in many instances to remove a longitudinal rod from a bone except by withdrawing it with a twisting motion. This factor, which we cannot completely explain, is probably due to built up friction and suction within the bone. It no doubt accounts for the many difficulties that have been experienced in removing rods of irregular shape in cross section because they cannot be rotated on removal.



MUCH TOO EARLY



TOO EARLY



NOW

When to Remove the Pin

The pin should not be removed until it has accomplished its purpose. As long as the fracture line is visible in the x-ray, bowing may occur if the pin is removed.

In elderly people it is frequently practicable to leave the pin in permanently. It is removed in the event that it causes irritation or the head is prominent enough to block the motion of a joint.

In children, particularly if an epiphysis has been traversed, remove the pin as soon as healing will permit. In fractures near joints this can sometimes be accomplished safely within four weeks. In contradistinction to this it may be necessary to leave the pin in a femur of an adult for one year if the fracture line has not completely faded away.

In the event of delayed or nonunion persistent rocking or torque at the fracture site will eventually result in fracture of the pin. This will frequently occur in less than one year, particularly if the fracture is subjected to ill-advised stress from excessive muscular activity or weight bearing. If bone healing is delayed, one should strongly consider removing the pin and replacing it with a fresh one. This can nearly always be done as a closed procedure through a small stab wound.

At the discretion of the surgeon, it may be practicable to leave the pin permanently, even in young adults. It must be remembered that corrosion of the metal is unlikely but can occur. Symptoms of bone irritation are pain, swelling, or tenderness.