

Gripping Needle Holders

Video Transcript

Tripod Grip

The thumb-ring finger grip, also known as the tripod grip, is most suitable for general needle-holder use. This grip allows for good control of the needle holder. As with other ringed instruments, the tripod grip requires only the tips of the thumb and ring finger to be inserted into the rings. This allows the surgeon to rapidly withdraw the fingers from the rings, or to easily shift to another grip for added stability or speed.

The technique to release the needle-holder jaws using the tripod grip varies according to whether the surgeon is right- or left-handed. With a right-handed needle holder, the ratchet is released by pushing the thumb ring away from the palm. For a left-handed surgeon using right-handed drivers with the left hand, the ratchet release is awkward, and the surgeon must push with the ring finger and pull out with the thumb to release the ratchet.

Advantages

A major advantage of the tripod grip is that releasing the needle can be done precisely, without undue stress to the tissue. The spring tension on the ratchet is gradually released before distracting the jaw teeth. This is very helpful when handling friable tissue, as uncoordinated or jerky release and regripping of the needle can result in tearing of tissue with potentially disastrous results.

Disadvantages

The main disadvantage of the tripod grip is that pronation of the wrist during needle passage is reduced, limiting the range of motion of the hand and arm during suturing.

Palm Grip

The palmed grip is the strongest needle-holder grip. It provides the greatest force when driving a needle through very tough tissue, such as cowhide, cartilage, tendons, and bone. With this grip, the handles and rings of the needle holder are held against the palm of the hand with the middle, ring, and little fingers, and the thumb wrapped around the instrument. The index finger is typically oriented along the top of, and parallel to, the needle holder's handles.

Advantages

The thumb and ring finger are closer to the jaws of the instrument than with the tripod grip, giving more control over needle movement. The needle holders can be rotated in the palm of the hand between the thumb and ring finger, which allows pronation when beginning a stitch, and supination when extracting the needle.



Disadvantages

The major disadvantage of the palmed grip is that it does not allow release and regripping of the needle without adjusting to another grip. Changing the grip in the middle of needle passage stresses tissue and might dislodge the needle. Grip changing is acceptable when suturing tough tissue, but is unacceptable with fragile structures where tearing can occur.

Thenar Grip

The thenar grip is a versatile needle-holder grip. It allows for good mobility, and ranks between the tripod grip and palmed grip in terms of both strength and direction control. In this grip, the thumb is inserted into the thumb ring and the ring is positioned on the ball of the thumb, known as the thenar eminence. Either the ring or little finger can be inserted into the other ring.

Advantages

The greatest advantage of the thenar grip is that it saves time during continuous suturing, by eliminating some of the suturing steps required with the other grips. The needle can be released and regripped for extraction without changing grips, which is necessary with the palmed grip.

Disadvantages

The major disadvantage of the thenar grip is the lack of precision and control in releasing the needle. To unlock the needle holders, the ball of the thumb pushes the shaft by the ring, while the ring finger pulls the opposite handle towards the palm. This releases the needle suddenly and the spring tension pops the handles apart. This less controlled needle release might lead to undesirable erratic motion of the needle, which may cause tissue tearing. Because of this “pop” release, the thenar grip is not recommended for precise suturing of delicate tissues.

Pencil Grip

Castroviejo needle holders are delicate instruments that are gripped and used in a unique manner. These needle holders are held in a pencil grip, between the thumb and index finger. The grip is close to the jaws and the fingers provide precise control, allowing for very fine suturing. Since the fine motion of the fingers allows for superior control, this grip is most often used for delicate microvascular work and ophthalmic applications.

To create a stitch using Castroviejo needle holders, the instrument is rotated on its axis between the index finger and thumb. For a right-handed surgeon, the rotation is in a clock-wise direction, and is counter-clockwise if the instrument is being held in the left hand. In both cases, the middle finger will “roll” off and away from the needle holders as the stitch is performed. To release the needle, only



finger pressure is used to release the lock, resulting in a highly controlled needle release. If necessary, the non-dominant hand can also be used to provide additional support for the needle holder. Surgeons also commonly brace their arms and wrists on the table surface or patient when using Castroviejo needle holders. This practice helps to eliminate shake and unnecessary hand motion.

Advantages

The main advantage of Castroviejo needle holders is that only finger pressure is required to precisely control needle release. Unlike other needle holders, no hand or wrist movements are utilized.

Disadvantages

One limitation is that this grip does not allow needle penetration in tough tissues.