

How to Grasp the Needle with Needle Holders

Video Transcript

Placing a stitch requires a sequence of carefully planned steps. Each step, if performed incorrectly, contributes to the loss of precious operative time. Skilled surgeons do not necessarily suture with rapid hand motions, but use deliberate, disciplined steps that eliminate nonproductive motions during suturing. Novice surgeons must practice handling the needle holder and placing sutures in order to learn how to perform this technique properly and efficiently. In this video, we will examine the first step of placing a stitch, how to grasp the needle within the jaws of the needle holder.

To grasp the needle in the needle holder, release the ratchet and open the jaws. The needle is positioned between the jaws, at the tip of the instrument, and is almost always held perpendicular to the axis of the jaws. This standard position allows for good needle stability and helps prevent bending. When the needle is held in this manner, the needle can be driven through tissue by merely rotating the holder on its axis. This minimizes the amount of motion needed to drive the needle, using less space to complete the stitch. When the needle is placed obliquely within the jaws, the handle of the holders must move through a wider arc to follow the curve of the needle through the tissue. There are few surgical situations in which oblique placement of the needle is required.

When grasping the needle with needle holders, you will also need to plan where along the curve of the needle it should be grasped. The needle can be grasped anywhere in the middle half of the needle arc. Normally, the needle is grasped about two thirds of the way from the tip. However, the needle can be grasped closer to the point, depending on the length of needle required to span the wound and the amount of force needed to penetrate the tissue. In soft tissues, the needle is usually grasped between the midpoint and two thirds away from the needle point, while in tough tissues, the needle is grasped closer to the needle tip, between one third and half way along the needle.

Positioning the needle near the swage allows a greater length of needle to be inserted through the tissue. This helps to reduce the likelihood of the needle backing out of the tissue when the needle is released from the jaws. It is also best for more needle to be exposed on the second side of a stitch in order to avoid regripping the needle near the sharp tip. Grasping the needle near the tip should be avoided, as this leads to needle dulling. The main disadvantage of grasping the needle close to the swage, is that more torque is placed on the needle during passage through dense tissue. This torque increases the risk of needle breakage or bending.

Positioning the needle within the needle holder near the sharp needle tip has its own advantages and disadvantages to consider. The closer to the point the needle is grasped, the greater the driving force that can be used without bending or breaking the needle. However, sometimes the needle must then be repositioned in the needle holder. When driving a needle through tough tissue, the needle is first advanced using a stabbing motion. Then, the needle is repositioned multiple times, closer to the swage, in order to complete the stitch.



Using Surgical Clamps

Removing Clamps

There are two methods for removing clamps from a ligated vessel or pedicle. In the first method, the thumb and ring finger are placed just into the rings of the forceps, using the tripod grip. The ratchet lock is then slowly disengaged in a well-controlled manner, rather than being “snapped” off the wound. This method is preferred when removing hemostatic clamps from important structures. However, the tripod grip does limit the rotation of the forceps during ligation and it is more difficult to discard the forceps after ligation.

In less critical situations, it is acceptable to remove the hemostats without putting the fingers through the rings. To disengage the ratchet this way using your right hand, the thumb, ring, and little fingers pinch the left ring, while the index finger pushes up on the right ring and shank. To perform the same releasing technique using your left hand, grasp the left ring between the thumb and index finger and disengage the lock by exerting upward pressure on the right ring with the middle, ring, and little fingers. This method of disengaging the ratchet lock is less controlled than the tripod grip. However, because the fingers rest outside the rings, the forceps can be rotated and turned in many angles to facilitate ligation and hemostat removal.

Regardless of which release method you use, always close the ratchet with one click before returning the forceps to the instrument table.

Ligature Passing

Surgical clamps can also be used to help place ligatures around vessels or structures prior to transection. In the method known as a “tie on a passer,” the surgeon first dissects around the vessel or pedicle to be occluded or ligated. Then the assistant clamps the end of the suture in the jaw tips of a curved or right-angled hemostatic clamp. The assistant then passes the suture strand to the waiting surgeon, keeping the suture strand taut with their assisting hand. When receiving the suture, the surgeon should avoid grasping the dangling free end of the suture, as this makes it difficult to coordinate the pass, wasting time.

An alternative passing method involves an assistant using a “tie on a passer” to feed suture to a waiting hemostat that is held by the surgeon. When utilizing this method, be certain that the assistant fully removes the forceps before pulling the suture around the structure. Failure to do so might cause accidental avulsion of the vessel and hemorrhage when the surgeon attempts to pull the tethered suture around the pedicle.

Suture Tagging

Clamps can be used to facilitate suturing. After knot tying a stitch, surgeons sometimes leave the knot ears long, or may choose to place a series of stitches without knotting the ends. Hemostats can be used to “tag” these ends for the surgeon in order to keep the ends away from the surgeon’s work or to expose the tissue to facilitate placement of an adjoining stitch.

Hemostats can also be used to hold the suture ends together to facilitate future knot tying, called preplacement of sutures. Preplacement is indicated when the tissue edges are drawn tightly together, creating poor exposure of the tissue plane for the next stitch. If the preplaced suture is tagged, the surgeon can open the wound more easily to expose the tissue plane for the next stitch. Sutures are often preplaced in deep perineal hernias, in urethral tears deep within the pelvic cavity, or when suturing in the oral cavity to help the surgeon identify and repair tissue layers accurately.



Using Surgical Clamps

Using Surgical Clamps as a Blunt Dissector

Hemostatic forceps are useful instruments for blunt dissection. Hemostats can be used to probe and spread tissue, as well as to isolate vessels and other structures to be “tagged.” When both blunt and sharp dissection is required, it is generally more efficient to use scissors for the job. Alternatively however, the surgeon can bluntly dissect and then elevate the tissue above the spread jaws of the clamp while an assistant transects the tissue with scissors or electro-surgical wand. This technique helps to protect the structures beneath the dissection plane.

Using Surgical Clamps as Tissue Holders and Retractors

Surgical clamps can be used to hold and retract tissue. While tissue forceps are useful for temporarily holding or retracting tissue, surgical clamps can hold tissue securely over long periods of time without fatigue. The selection of the particular clamp is based on the strength of the tissue and whether the tissue will be removed. Ideally, only atraumatic clamps should be used to hold or retract tissue that will not be removed during surgery. Therefore, although a crushing hemostat like the Allis tissue forceps does provide a secure grasp of the tissue, they are generally too traumatic to use on intact viscera or skin. Instead, Allis tissue forceps should be restricted to jobs like grasping the margin close to a neoplasm that will be excised.

To retract or hold hollow organs atraumatically, surgeons often use “stay sutures.” A stay suture is placed partial thickness through the hollow organ, and the ends are left long and clamped with small hemostats, like mosquito forceps. An assistant can then use the “tagged” sutures as handles to manipulate the organ. Alternatively, if an assistant is unavailable to hold the stay sutures, the sutures can be clamped to the drape material.

Using Surgical Clamps in Visceral Surgery

Clamps are frequently utilized during visceral surgery. Atraumatic clamps, like the Doyen forceps, are designed to clamp off the lumen of a hollow viscera to control leakage of its contents. They are most commonly used in intestinal anastomosis. Ingesta is milked away from the proposed anastomosis area, and an atraumatic clamp is placed on the bowel to temporarily hold back the contamination until the repair is complete. Crushing clamps are also frequently used during visceral surgery. Crushing clamps, like the Allen forceps, are used to remove lesions. They can also be used as a guide for cutting through the hollow viscera. Note that the crushed area must always be removed with the lesion.

